



**TRANSPORT AND SOCIAL EXCLUSION IN DEVELOPING COUNTRIES:
AN ANALYSIS OF THE ISSUE IN ABIDJAN (CÔTE D'IVOIRE)**

Bassirou BANDE

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Bassirou BANDE

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(Ph. D. Thesis)

Bassirou BANDE

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ABSTRACT

This study investigates the nexus between transportation and social exclusion in Abidjan, Côte d'Ivoire, focusing on public transport's dynamics—availability, accessibility, affordability, and acceptability—and their societal impacts. Despite burgeoning research on Transport-Related Social Exclusion (TRSE), scant attention has been paid to Sub-Saharan Africa, and Abidjan represents a critical case due to its rapid urbanization and ensuing transportation and accessibility challenges. These challenges exacerbate social exclusion by limiting individual mobility and societal participation, marking TRSE as a pressing issue for the city. Employing a mixed methods approach, combining quantitative analysis of 402 surveys with qualitative insights from 10 focus group interviews and 10 key informants, this research unveils the intricate reality of TRSE in Abidjan. It underscores the disproportionate mobility hardships on vulnerable populations, including the elderly, disabled, youth, and low-income residents. By identifying key socioeconomic, spatial, and demographic factors, the study elucidates the drivers of mobility disparities, thereby offering a detailed exploration of the mobility barriers faced by socially excluded groups. The findings suggest actionable, context-specific strategies for mitigating TRSE and fostering a more inclusive transport system, potentially enhancing equitable transport access citywide. This research significantly contributes to the literature on TRSE in African urban settings, providing valuable insights for improving transport planning and policy.

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GELİŞMEKTE OLAN ÜLKELERDE ULAŞIM İLE SOSYAL DIŞLANMA: KONUNUN ABİDJAN (FİLDİŞİ SAHİLİ) ÖRNEĞİNDE İRDELENMESİ

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ÖZET

Bu çalışma, Abidjan, Fildişi Sahili'nde toplu taşımanın dinamiklerine—mevcudiyet, erişilebilirlik, uygun fiyatlılık ve kabul edilebilirlik—ve bunların toplumsal etkilerine odaklanarak ulaşım ile sosyal dışlanma arasındaki ilişkiyi araştırmaktadır. Ulaşım Kaynaklı Sosyal Dışlanma (TRSE) üzerine artan araştırmalara rağmen, Sahra Altı Afrika'ya ve Abidjan'a yeterince dikkat çekilmemiştir. Hızlı kentleşme ve buna bağlı ulaşım ve erişilebilirlik zorlukları nedeniyle Abidjan, kritik bir vaka olarak öne çıkmaktadır. Bu zorluklar, bireysel hareketliliği ve toplumsal katılımı kısıtlayarak sosyal dışlanmayı şiddetlendirmekte, TRSE'yi şehir için acil bir sorun haline getirmektedir. 402 anketin nicel analizi ile 10 odak grup görüşmesi ve 10 anahtar bilgi sağlayıcıdan elde edilen nitel içgörülerle birleştirilmiş karma yöntem yaklaşımını kullanarak, bu araştırma Abidjan'daki TRSE'nin karmaşık gerçekliğini ortaya koymaktadır. Araştırma, yaşlılar, engelliler, gençler ve düşük gelirli sakinler gibi kırılgan nüfus üzerindeki orantısız hareketlilik zorluklarını vurgulamaktadır. Temel sosyo-ekonomik, mekansal ve demografik faktörleri belirleyerek, çalışma hareketlilik farklılıklarının sürükleyicilerini aydınlatarak, sosyal olarak dışlanmış grupların karşılaştığı hareketlilik engellerinin detaylı bir incelemesini sunmaktadır. Bulgular, TRSE'yi hafifletmek ve şehir genelinde daha kapsayıcı bir ulaşım sistemi oluşturmak için uygulanabilir, bağlama özgü stratejiler önermektedir. Bu araştırma, Afrika şehirlerindeki TRSE literatürüne önemli katkılar sağlamakta ve ulaşım planlaması ve politikası geliştirme için değerli içgörüler sunmaktadır.

1. Giriş

Bağlam

Sosyal dışlanma ile ulaşım arasındaki ilişki, bireylerin hareketliliğini ve fırsatlarını etkilediği için kentsel çalışmalar ve ulaşım araştırmalarında kritik bir öneme sahiptir. TRSE, kentsel planlama ve sosyal politika söylemlerinde kritik bir endişe olup, dünya çapındaki şehirleri etkilemektedir. TRSE, yetersiz ulaşım sistemlerinin, temel hizmetlere, istihdam olanaklarına ve sosyal ağlara erişimi kısıtladığında ve bu kısıtlamaların dezavantajlı toplulukları orantısız bir şekilde etkilediğinde ortaya çıkar. Gelişmiş ülkelerde odak noktası, düşük gelirli, yaşlı ve engelli nüfus için ulaşımın uygun fiyatlılığı ve erişilebilirliği üzerinedir. Ancak, Sahra Altı Afrika, hızlı kentleşme, sınırlı altyapı gelişimi ve sosyo-ekonomik eşitsizlikler

nedeniyle benzersiz ulaşım zorluklarıyla karşı karşıyadır. Abidjan gibi şehirlerde TRSE üzerine yapılan çalışmalar, dezavantajlı nüfusların ihtiyaçlarını ele alan kapsayıcı ulaşım politikalarına acil bir ihtiyaç olduğunu vurgulamaktadır.

Araştırma probleminin formülasyonu

Fildişi Sahili'nin ekonomik başkenti Abidjan, hızlı kentleşme, altyapı kısıtlamaları ve sosyo-ekonomik eşitsizlikler nedeniyle benzersiz bir TRSE sorunu ile karşı karşıyadır. Şehrin düşük gelirli ve dezavantajlı nüfuslara ev sahipliği yapan gayri resmi mahalleleri, toplu taşıma erişiminden yoksundur ve bu da sosyal dışlanmaya yol açmaktadır. TRSE sorunu, erişilebilirlik, uygun fiyatlılık, güvenlik ve güvenilirlik sorunları olarak kategorize edilebilir. Erişilebilirlik, insanların yaşadıkları yer ile istihdam, eğitim ve hizmetlere erişim sağlayabilecekleri yerler arasındaki mekansal uyumsuzluk nedeniyle şiddetlenmektedir. Uygun fiyatlılık, ulaşım maliyetlerinin hane halkı gelirinin önemli bir bölümünü tüketmesi nedeniyle önemli bir endişe kaynağıdır. Güvenlik ve güvenilirlik, kazalar, aşırı kalabalık ve suç olayları yaygın olduğundan genellikle yetersizdir. Tutarlı bir kentsel ulaşım politikası ve kurumsal çerçevenin olmaması sorunu daha da karmaşık hale getirmektedir. Sınırlı hareketlilik, ekonomik fırsatlara, eğitim ve sağlık tesislerine ve sosyal ağlara erişimi kısıtlayarak yoksulluk ve dışlanma döngülerini sürdürmektedir.

Araştırma amaçları ve soruları

Bu araştırma, Abidjan'da TRSE'yi inceleyerek, ulaşım erişimi eşitsizlikleri ve sosyal dışlanmanın rolünü araştırmaktadır. TRSE'nin günlük hareketlilik ve faaliyetlere katılım üzerindeki etkisini, sosyo-ekonomik ve mekansal faktörlerin ulaşım hizmetlerinin erişilebilirliğini, uygun fiyatlılığını, mevcudiyetini ve kabul edilebilirliğini nasıl etkilediğini incelemektedir. Araştırma, Abidjan'daki toplu taşımanın mevcut durumunu değerlendirmeyi, en çok etkilenen nüfusları belirlemeyi, TRSE'nin temel hizmetlere erişim üzerindeki etkisini analiz etmeyi ve TRSE'yi azaltmak için politika ve planlama çözümlerini keşfetmeyi amaçlamaktadır. Araştırma soruları, Abidjan'ın toplu taşıma sisteminin operasyonel gerçekliklerini anlamak, en kırılgan demografik grupları belirlemek ve TRSE'nin günlük yaşam ve toplumsal katılım üzerindeki somut etkilerini analiz etmek üzerine odaklanmaktadır. Ayrıca, daha kapsayıcı kentsel hareketliliği teşvik etmek ve sosyal dışlanmayı azaltmak için uygulanabilir stratejiler ve politika müdahaleleri önermektedir.

Çalışmanın önemi

Bu çalışma, TRSE'nin kentsel hareketlilik, sosyal eşitlik ve sürdürülebilir kentsel gelişim üzerindeki etkisini araştırarak Abidjan gibi gelişmekte olan şehirlerde bu konunun önemini vurgulamaktadır. TRSE'nin ele alınması, erişilebilirliği iyileştirmek, sosyal eşitliği teşvik etmek ve sürdürülebilir kalkınmayı kolaylaştırmak için kritik öneme sahiptir. Erişilebilir, uygun fiyatlı ve güvenli ulaşım sistemlerinin sağlanması, sosyal dışlanmayı azaltabilir ve dezavantajlı toplulukların yaşam kalitesini artırabilir. Ayrıca, ulaşım planlamasına sosyal eşitliği entegre etmek, daha dayanıklı ve sürdürülebilir kentsel ortamların oluşmasına katkıda bulunabilir. Araştırma, benzer zorluklarla karşı karşıya olan diğer gelişmekte olan şehirler için değerli içgörüler sunmakta ve etkili kentsel planlama ve ulaşım politikalarının gerekliliğini vurgulamaktadır.

Tezin yapısı

Bu tez altı bölüme ayrılmıştır: Giriş, Arka Plan ve Literatür Taraması, Çalışma Şehri, Araştırma Tasarımı ve Metodolojisi, Ulaşım Sorunlarının Analizi, Anket Sonuçları ve Tartışma, Sonuç ve Öneriler. Giriş, Fildişi Sahili ve Büyük Abidjan Bölgesi gibi gelişmekte olan ülkelerde sosyal dışlanma ve ulaşımın etkilerine odaklanarak araştırmanın kapsamlı bir özetini sunar. Araştırma tasarımı ve metodolojisi detaylandırılmış olup, sonuçlar farklı sosyo-ekonomik gruplar arasındaki günlük seyahat davranışlarını mikro düzeyde incelemektedir. Çalışma ayrıca, beş gelişmekte olan ülkede TRSE'nin karşılaştırmalı bir analizini sunarak, politika yapıcılar ve gelecekteki araştırmalar için uygulanabilir öneriler sunmaktadır. Sonuç bölümü, Abidjan'da toplu taşımanın daha kapsayıcı hale getirilmesi için önerilerde bulunmaktadır.

2. Sosyal Dışlanma ve Ulaşım: Derinlemesine İnceleme ve Analiz

Ulaşım ve sosyal dışlanma dinamikleri

Ulaşım, sosyal dışlanma ve kapsayıcılıkta kritik bir rol oynamaktadır ve güvenilir ve uygun fiyatlı ulaşım erişimin sınırlı olması, sosyal dışlanmayı şiddetlendirebilir. Kapsayıcı ulaşım sistemleri, özellikle düşük gelirli bireyler, etnik ve ırksal azınlıklar, engelliler, yaşlılar ve cinsiyet ve cinsel azınlıklar gibi dışlanmaya en yatkın topluluk üyeleri için hareketliliği ve erişimi sağlayarak sosyal kapsayıcılığı kolaylaştırabilir.

Sosyal kapsayıcılığa doğru ilerlemek için sosyal dışlanmanın temel nedenlerini ele alan ve toplumu kapsayıcılığı aktif olarak teşvik eden entegre bir yaklaşım gerekmektedir; bu, politika yapıcılar, toplum örgütleri ve vatandaşlar arasında işbirliği gerektirir. Ulaşım ve sosyal dışlanma arasındaki ilişki, toplumsal değişikliklerle birlikte evrimleşmiş, daha geniş ekonomik, sosyal ve teknolojik gelişmeleri yansıtmaktadır.

Ulaşımında sosyal dışlanmanın çok yönlü doğası, çeşitli nüfus gruplarının erişimini kısıtlayan fiziksel, ekonomik ve sosyal engellerin etkileşimini vurgulamaktadır. TRSE'nin temel nedenleri, sosyo-ekonomik eşitsizlikler, araba sahipliğini tercih eden kentsel planlama politikaları, ayrımcılık ve sosyal önyargılar, teknolojik ve bilgi engelleri gibi daha geniş sistemik ve yapısal sorunlara dayanmaktadır.

Ulaşım dışlanmasından özellikle etkilenen birkaç dezavantajlı grup bulunmaktadır; bunlar arasında fiziksel engelliler, düşük gelirli bireyler ve araç erişimine bağımlı bölgelerde yaşayanlar bulunmaktadır. Bu nedenleri ele almak ve tüm topluluk üyelerinin ihtiyaçlarına hitap eden ulaşım sistemleri geliştirmek için politika müdahalelerini, kapsayıcı kentsel planlamayı ve toplu taşıma altyapısı ve hizmetlerine yönelik hedefli yatırımları içeren kapsamlı bir yaklaşım gerekmektedir.

Toplu taşımada marjinalleştirme, kentsel hareketlilik ağlarının erişilebilirliği, hizmet kalitesi ve kapsayıcılığı üzerinde önemli bir etkiye sahiptir. Engelliler, düşük gelirli bireyler, etnik ve ırksal azınlıklar, yaşlılar ve kırsal ve yarı kentsel bölgelerde yaşayanlar, topluma katılım ve sağlık hizmetlerine erişimlerini engelleyen önemli engellerle karşılaşmaktadır. Araç sahipliği ile ilgili ekonomik zorluklar da bu engelleri şiddetlendirmektedir.

Yetersiz politika ve planlama, ekonomik kısıtlamalar, sosyal ve kültürel engeller ve coğrafi farklılıklar, toplu taşıma sistemlerinde belirli grupların marjinalleşmesine katkıda

bulunmaktadır. Sınırlı finansman ve bütçe öncelikleri, genellikle marjinalleştirilmiş nüfuslar tarafından kullanılan hizmetleri orantısız bir şekilde etkileyen ödönlere yol açar. Stereotipler, damgalama ve ayrımcılık, toplu taşıma sistemlerinin tasarımı ve işletilmesini etkileyerek belirli gruplar için düşmanca ortamlar yaratabilir.

Ulaşım engelleri, sağlık hizmetlerine erişimi önemli ölçüde etkilemektedir ve engelliler, yetersiz toplu taşıma seçenekleri nedeniyle sağlık tesislerine ulaşmakta zorluklar yaşamaktadır. Engellilere yönelik özellikler ve optimize edilmiş seyahat güzergahları dahil olmak üzere geliştirilmiş toplu taşıma altyapısı ve hizmetleri, sağlık hizmetlerine erişimi iyileştirmek için gereklidir.

Toplu taşıma sistemlerinde marjinalleştirilen kırılgan grupların deneyimlerini hafifletmek için ulaşım altyapısını ve erişilebilirliği artırmayı amaçlayan kapsamlı politika müdahaleleri gereklidir. Stratejiler arasında kapsayıcı planlama ve tasarım, uygun fiyatlılık programları, geliştirilmiş erişilebilirlik özellikleri, ayrımcılıkla mücadele önlemleri ve kırsal ve yarı kentsel hizmet genişlemesi bulunmaktadır.

Toplu taşıma, erişilebilirlik ve uygun fiyatlılığa odaklanarak önemli bir sosyal eşitleyici olabilir. İnsanlar sınırlı fırsatlar ve hizmetlere erişim nedeniyle topluma katılamadığında ulaşım dışlanması meydana gelir. Sosyal olarak dışlanmış bireyler, hareketsizlik, ulaşımın mevcut olmaması, erişilemezliği, güvenlik ve emniyet hizmetleriyle ilgili zorluklar yaşarlar. Düşük gelirli bireyler, yaşlılar ve tek ebeveynli aileler için istihdam merkezlerine, iş merkezlerine ve sağlık hizmetlerine yetersiz erişim, sosyal marjinalleşmenin zorluklarını yansıtmaktadır.

Bu sorunu ele almak için, düşük gelirli bireylerin yaşadıkları bölgeleri iş yerleri, okullar, kolejler, sağlık merkezleri, kreşler ve alışveriş merkezleri gibi temel noktalara bağlayan yeterli bağlantı sunan yeni ağlar oluşturulmalıdır. Sürdürülebilir ulaşım odaklı kentsel politikalar, toplu taşıma ve bisiklet altyapısı, mobilite hizmeti olarak (MaaS), akıllı ve paylaşımlı mobilite ve entegre biletleme ve ortak kullanım tesislerini içermelidir.

Toplu taşıma, tüm toplum üyeleri için eşit şartlar sağlayarak uygun fiyatlı, erişilebilir ve güvenilir hareketlilik çözümleri sunma potansiyeline sahiptir. Evrensel tasarım ve erişilebilirlik, çeşitli kullanıcı ihtiyaçlarını karşılamak için gereklidir ve erişilebilir altyapıya yapılan yatırımlar, herkesin toplu taşıma hizmetlerini kullanabilmesini sağ lamak için önemlidir.

Etkili ve yaygın toplu taşıma ağları, dezavantajlı mahalleler ile ekonomik merkezler arasındaki boşluğu kapatarak mekansal eşitliği teşvik edebilir ve yetersiz hizmet alan bölgelerin sakinleri için eşit fırsatlar sağlayabilir. Toplu taşıma ayrıca eğitim kurumlarına erişimi kolaylaştırır, sağlık hizmetlerine erişimi iyileştirir ve toplumsal ve topluluk katılımını teşvik eder, topluluk ve aidiyet duygusunu artırır.

TRSE: kavramsallaştırma ve boyutlar

TRSE, kentsel ve ulaşım planlamasında sosyal eşitlik ile ulaşım sistemleri arasındaki bağlantıya odaklanan kritik bir çalışma alanıdır. Çoğu TRSE çalışması, ulaşım dışlanmasının ölçülmesi, kavramsallaştırılması ve pratikte tanımlanmasına odaklanır. TRSE, bireylerin, yetersiz hareketlilik nedeniyle topluluğun sosyal, ekonomik ve politik yaşamına katılamaması olarak tanımlanır.

TRSE kavramı, sosyal dışlanmanın daha geniş çerçevesine dayanmaktadır ve özellikle ulaşım sistemlerinin dışlayıcı süreçlere nasıl katkıda bulunabileceğini veya bu süreçleri nasıl hafifletebileceğini ele alır. Teorik temeli, sosyal eşitlik teorisi, mekansal uyumsuzluk hipotezi ve erişilebilirlik planlaması unsurlarını birleştirir. Sosyal eşitlik teorisi, tüm bireylerin, özellikle marjinalleşmiş topluluklardan olanların, topluma tam olarak katılma fırsatına sahip olmalarını sağlamak için eşit ulaşım erişiminin önemini vurgular.

Erişilebilirlik planlaması, kentsel sistemlerin, ulaşım dahil olmak üzere, tüm bireylerin istenen hizmetlere ve faaliyetlere erişimini ne ölçüde sağladığına odaklanır. Erişilebilirlik kavramı, TRSE'nin merkezinde yer alır ve insanların topluma tam katılım için gerekli olan temel hizmetlere, istihdama, eğitime ve diğer faaliyetlere ulaşma yeteneğiyle doğrudan ilişkilidir.

Sosyal dışlanma ve ulaşım planlaması ile ilgili önceki tartışmalar, ulaşımın dışlanma düzeyi üzerindeki etkisini göz ardı etmiştir. TRSE, bireylerin topluma tam olarak katılma yeteneklerini önemli ölçüde etkileyen birkaç ilişkili şekilde ortaya çıkar.

Fiziksel erişilebilirlik, tüm bireyler, engelliler dahil olmak üzere, ulaşım sistemlerinin kullanılabilirliğini etkileyen tasarım ve altyapıya atıfta bulunur. Toplu taşıma istasyonlarında asansör veya rampa eksikliği gibi erişilemez ulaşım altyapısı, sosyal dışlanmaya katkıda bulunur. Kapsayıcı tasarım, yaşlılar ve engelliler dahil olmak üzere tüm kullanıcılar için eşit erişimi sağlamak için kentsel planlamada önemlidir.

Coğrafi erişilebilirlik, ulaşım hizmetlerinin mekansal dağılımını ve bunun temel hizmetlere ve fırsatlara erişimi nasıl etkilediğini vurgular. Ekonomik erişilebilirlik, ulaşım seçeneklerinin uygun fiyatlılığını içerir ve düşük gelirli haneler için önemli bir engel olabilir. Ücret indirimi planlarının ve sübvansiyonların uygulanması, ekonomik erişilebilirliği iyileştirerek toplumsal faaliyetlere daha fazla katılımı sağlayabilir. Zamansal erişilebilirlik, ulaşım hizmetlerinin günün farklı saatlerinde mevcut olmasına atıfta bulunur ve özellikle geleneksel olmayan çalışma saatlerine sahip bireyler için önemlidir. Bilgi erişilebilirliği, ulaşım hizmetleri hakkında bilgi bulunabilirliği ve anlaşılabilirliği ile ilgilidir ve seyahat planlaması için önemlidir.

Sosyal ve psikolojik boyutlar da TRSE'de önemli bir rol oynar ve ulaşım ortamında güvenlik duyguları ve belirli ulaşım türlerini kullanmayla ilişkili sosyal damgalar gibi unsurları içerir. Church ve diğerleri (2000), TRSE'nin olası nedenleri olarak üç süreci belirlemiştir: (1) hane içinde zaman ve mekan organizasyonu, (2) ulaşım sistemi yapısı ve (3) bireylerin zaman ve mekanda erişmek istedikleri tesisler ve fırsatların organizasyonu. Yedi boyutlu bir kavramsal çerçeve önerdiler: fiziksel dışlanma, coğrafi dışlanma, tesislerden dışlanma, ekonomik dışlanma, zaman temelli dışlanma, korku temelli dışlanma ve mekansal dışlanma.

TRSE çerçevesi, ulaşım sistemlerinin sosyal kapsayıcılık üzerindeki etkisini anlamak için çok boyutlu bir yaklaşımdır. Fiziksel, coğrafi, ekonomik, zamansal ve bilgi erişilebilirliği boyutlarını içerir. Fiziksel erişilebilirlik, ulaşım sistemlerinin engelliler dahil tüm bireyler için kullanılabilirliğini ifade eder. Coğrafi erişilebilirlik, ulaşım hizmetlerinin mekansal dağılımını ifade eder ve kentsel ve kırsal alanlar arasındaki farklılıkları vurgular. Ekonomik erişilebilirlik, ulaşım seçeneklerinin uygun fiyatlılığını içerir ve düşük gelirli haneler için bir engel olabilir. Zamansal erişilebilirlik, ulaşım hizmetlerinin günün ve haftanın farklı zamanlarında mevcudiyetini ifade eder ve geleneksel olmayan çalışma saatlerine veya bakım sorumluluklarına sahip olanları etkiler. Bilgi erişilebilirliği, ulaşım hizmetleri hakkında bilgi

bulunabilirliği ve anlaşılabilirliği ile ilgilidir ve dil engelleri veya internet erişimi olmayan kişiler için önemlidir.

TRSE çerçevesi ayrıca sosyal konum temelli dışlanma, zaman temelli dışlanma, coğrafi dışlanma, bilişsel ve fiziksel dışlanma ve korku temelli dışlanmayı içerir. Bu boyutlar, ulaşım sistemlerinin sosyal kapsayıcılığı nasıl kolaylaştırabileceğini veya engelleyebileceğini anlamaya yardımcı olur. Ancak, sosyal dışlanma ve ulaşım konusundaki araştırmalardaki ilerlemeler, yetersiz açıklama ve değerlendirme araçlarının eksikliği nedeniyle yerel planlama ajansları arasında henüz paylaşılmamıştır. Kabul edilebilir standartları ve sosyal kapsayıcılık için toplu taşıma seviyelerini belirlemek için ölçüme dayalı araçlara ihtiyaç vardır .

TRSE kavramı, çok boyutlu doğası, deneyimlerin öznelliği, veri sınırlamaları ve sosyal dışlanmanın dinamik ve bağlama özgü yönleri nedeniyle karmaşıktır. TRSE, fiziksel, coğrafi, ekonomik, zamansal, bilgi ve sosyal-psikolojik boyutları içerir ve her biri farklı ölçüm yaklaşımları gerektirir. Hareketlilik ve erişilebilirlik, TRSE'nin en önemli boyutlarından ikisidir, ancak mekansal erişilebilirlik, istihdam, gelir, engellilik, barınma ve eğitimi içeren yoksunluk endeksi, bireysel zaman ve mekan kısıtlamalarını göz ardı eder.

Ulaşım sistemleriyle ilgili bireysel deneyimlerin öznelliği ve çeşitliliği de zorluklar oluşturur. İyi olma ve memnuniyetin öznel ölçümleri, ulaşımın sosyal dışlanma üzerindeki etkisini anlamada kritik bir rol oynar. Ulaşım kullanımı, erişilebilirliği ve uygun fiyatlılığı hakkında veri bulunabilirliği ve kalitesi genellikle yetersiz veya elde edilmesi zor olup, doğru değerlendirmeyi engeller. TRSE ayrıca dinamik ve bağlama özgüdür; farklı coğrafi konumlar, kültürler ve zaman içinde değişir.

Bu zorlukları ele almak için, TRSE'nin çok boyutlu doğasını yakalayabilecek tutarlı ve kapsamlı bir ölçüm çerçevesine ihtiyaç vardır. Ancak, TRSE'nin çeşitli tezahürleri ve farklı bağlamlar, tek tip bir yaklaşım geliştirmeyi zorlaştırmaktadır. Esnek ve uyarlanabilir bir ölçüm çerçevesi, politika, altyapı, teknoloji ve toplumsal normlardaki değişiklikler karşısında geçerliliğini ve etkinliğini koruyabilmesi için gereklidir.

Fakir mahallelerde yaralanma veya ölüm gibi ulaşım riskleri, maruz kalan ortamlar ve tehlikeler nedeniyle daha olasıdır. Anketler ve niteliksel araştırmalar, TRSE'den etkilenen bireylerin öznel deneyimlerini ve algılarını yakalayarak bileşik indeksler ve coğrafi analizler yoluyla elde edilen nicel ölçümleri tamamlayabilir.

Sosyal dışlanmayı daha iyi anlamak ve ölçmek için çok boyutlu bir yaklaşım önerilmektedir; zira araştırma, geleneksel olarak marjinalleşmiş grupları tanımlamış ve dışlayıcı etkilerini ad hoc yöntemlere dayalı olarak analiz etmiştir. TRSE'nin çeşitli katkıda bulunan faktörlerini yakalayabilecek ve uzun vadeli ihtiyaçların karşılanmasını sağlayacak birleşik bir ölçüm çerçevesi geliştirmek için disiplinler arası işbirliği gereklidir.

3. Gelişmekte Olan Ülkelerde Ulaşım Dinamikleri: Abidjan'a Odaklanarak

Ulaşım ve sosyoekonomik gelişim

Gelişmekte olan ülkelerde ve Afrika şehirlerinde ulaşım, ekonomik büyüme, sosyal eşitlik ve sürdürülebilir kalkınmayı etkileyen sosyoekonomik gelişimin kritik bir yönüdür. Mal ve insan hareketini kolaylaştırır, kentleşme kalıplarını etkiler ve pazarlara, istihdama, eğitime

ve sağlık hizmetlerine erişimi artırır. İyi gelişmiş ulaşım sistemleri, ticareti kolaylaştırır, verimliliği artırır, yatırımları çeker ve mal ve hizmetlerin hareketini destekleyerek genel ekonomik büyüme ve refaha katkıda bulunur. Kırsal ve kentsel alanlar arasındaki ulaşım bağlantısının iyileştirilmesi, tarım ürünlerinin pazarlara verimli bir şekilde taşınmasını sağlayarak tarımsal kalkınmayı teşvik edebilir. Ulaşım ve sosyoekonomik gelişim arasındaki ilişki, ekonomik büyüme, sosyal eşitlik ve sürdürülebilir kalkınma gibi çeşitli açılardan anlaşılabilir. Yollar, demiryolları, limanlar ve havaalanları gibi ulaşım altyapısına yapılan yatırımlar, ekonomik getiri sağlayabilir, pazar erişimini artırabilir ve doğrudan yabancı yatırımı çekebilir.

Gelişmekte olan ülkelerdeki ulaşım zorlukları

Gelişmekte olan ülkelerdeki ulaşım zorlukları çok yönlüdür ve kapsamlı çözümler gerektirir. Bu zorluklar arasında altyapı yetersizlikleri, finansman sınırlamaları, hızlı kentleşme, yönetim ve kurumsal zayıflıklar, çevresel ve sosyal endişeler ve gayri resmi ulaşım sektörü bulunmaktadır. Gelişmekte olan ülkelerdeki altyapı boşlukları, hareketliliği ve temel hizmetlere erişimi sınırlamaktadır; finansman sınırlamaları ise ekonomik büyümeyi ve sosyal dışlanmayı engelleyebilir. Kamu-özel ortaklıkları ve uluslararası kalkınma kredileri gibi yenilikçi finansman mekanizmaları, ulaşım projeleri için gerekli sermayeyi sağlayabilir. Hızlı kentleşme, ulaşım sistemleri için hem zorluklar hem de fırsatlar sunar; ancak mevcut yetersizlikleri şiddetlendirebilir. Etkili ulaşım planlaması ve yönetimi için kurumsal kapasitenin güçlendirilmesi ve yönetim çerçevelerinin iyileştirilmesi kritiktir.

Çevresel ve sosyal endişeler de ulaşım sistemlerinde önemlidir. Sürdürülebilir ulaşım çözümlerinin benimsenmesi, motorize olmayan ulaşım ve düşük emisyonlu toplu taşıma gibi çözümler, çevresel ve sosyal zorlukları ele alabilirken, hareketlilik ihtiyaçlarını karşılayabilir. Bu endişeleri ele almak, hareketlilik ihtiyacı ile sürdürülebilirlik ve sosyal eşitlik zorunluluğu arasında bir denge kuran çok yönlü bir yaklaşım gerektirir.

Sonuç olarak, gelişmekte olan ülkelerdeki ulaşım zorluklarını ele almak, entegre planlama, yenilikçi finansman, iyileştirilmiş yönetim ve sürdürülebilirlik ve eşitliğe odaklanmayı gerektirir. Bu zorlukları ele alarak, gelişmekte olan ülkeler erişilebilirliği, sosyoekonomik gelişimi ve yaşam kalitesini iyileştirebilir.

Sahra altı afrika'da kentleşme olgusu

Sahra Altı Afrika, çoğu şehri plansız büyüyen ve çevresel ve sosyal sorunlarla karşılaşan hızlı bir kentleşme yaşamaktadır. Bu demografik değişim, bölgenin genç demografik profili tarafından hızlandırılmakta olup, kalkınma için hem fırsatlar hem de zorluklar sunmaktadır. 2030 yılına kadar, Sahra Altı Afrika ve Güney Asya'nın hızlı bir kentleşme yaşayacağı ve 2050 yılına kadar tahminen 750 milyon kişinin kenteleşeceği öngörülmektedir. Bölgenin kentsel nüfusunun hızla artması beklenmektedir ve kentsel nüfusun %55'inin 500.000'den az nüfusa sahip bölgelerde ve %65'inin 1.000.000'dan az nüfusa sahip şehirlerde yaşayacağı tahmin edilmektedir.

Kentleşmenin etkileri arasında kentsel planlama eksikliği, temel hizmetlerin yetersiz sağlanması, yetersiz altyapı, artan kirlilik ve trafik sıkışıklığı, düzensiz trafik ve teknik, mali ve kurumsal kapasite eksikliği yer almaktadır. Hızlı kentleşme, mevcut altyapı üzerinde büyük baskı yaratarak trafik sıkışıklığına, kirliliğe ve yetersiz hizmet sunumuna yol açar. Kentleşme hızı, hükümetlerin yeterli konut sağlama yeteneğini aşarak, sınırlı temel

hizmetler ve altyapıya sahip gayri resmi yerleşimlere yol açar. Kentsel genişleme, çevresel bozulmaya, yeşil alanların kaybına, artan kirliliğe ve yetersiz planlama ve altyapı nedeniyle iklim değişikliği etkilerine karşı kırılganlığa katkıda bulunur.

Sürdürülebilir kentleşme, vatandaşlara uygun fiyatlı konut, sağlık hizmetleri, eğitim ve ulaşım sağlamak için kritik öneme sahiptir. Ancak, birçok kentsel alan, yol yapımının ötesinde hareketliliği dikkate alan sürdürülebilir bir mekansal kalkınma süreci ve uzun vadeli bir vizyondan yoksundur. Arazi kullanımı ile ulaşım ve konut politikalarını birleştiren entegre kentsel planlama yaklaşımlarının benimsenmesi, daha düzenli ve sürdürülebilir kentsel büyümeyi sağlayabilir. Karma kullanımlı kompakt kalkınma, özel araç kullanımını azaltabilir ve toplu taşıma kullanımını teşvik edebilir.

Ulaşım, kentsel sürdürülebilirliğin önemli bir bileşenidir ve kapsayıcı kentsel kalkınmayı teşvik eden politikalar, faydaların eşit dağılımını sağlayabilir. Ulaşımın sürdürülebilirliğini sağlamak için, toplu taşımanın özellikle azınlıklar ve dışlanmış insanlar için erişilebilirliği, ulaşım projelerinde daha fazla önem kazanmalıdır.

Sahra Altı Afrika'da ulaşım sistemleri, kirlilik, trafik sıkışıklığı, gecikmeler, yüksek ücretler ve yetersiz erişilebilirlik gibi sorunlarla karşı karşıyadır. Para-transit olarak bilinen yaygın toplu taşıma modu, güvenlik riskleri, kırılgan nüfuslar için yetersiz hizmet, tutarsız ve yüksek ücretler ve çevresel bozulma gibi sorunları da beraberinde getirir. Erişilebilir, uygun fiyatlı ve güvenilir ulaşımın eksikliği, hareketliliği önemli ölçüde sınırlar ve sağlık hizmetleri, istihdam ve eğitime erişimi engeller.

Ulaşım zorlukları aynı zamanda psikolojik ve zihinsel sağlık endişeleri gibi toplumsal faktörleri de kapsar ve bu da bireylerin ulaşımı etkili bir şekilde kullanma ve günlük faaliyetlere katılma yeteneklerini engeller. Araç paylaşımı girişimleri, gelişmekte olan ülkelerdeki kırılgan demografiler arasında daha kapsayıcı bir çözüm olarak ortaya çıkmaktadır.

Abidjan'daki ulaşım zorlukları

Hızla büyüyen bir şehir olan Fildişi Sahili'ndeki Abidjan, ekonomik kalkınma, çevresel sürdürülebilirlik ve sakinlerinin yaşam kalitesini etkileyen önemli ulaşım zorluklarıyla karşı karşıyadır. Bu zorluklar, kentleşme baskılarından, altyapı eksikliklerinden ve sürdürülebilir hareketlilik çözümlerine olan ihtiyaçtan kaynaklanmaktadır. Abidjan'ın toplu taşıma sistemi, resmi ve gayri resmi hizmetler dahil olmak üzere kara tabanlı sistemlere dayanmaktadır. Zorluklar arasında trafik sıkışıklığı, yetersiz toplu taşıma seçenekleri ve altyapının bakım ve genişletme ihtiyacı bulunmaktadır.

Trafik sıkışıklığı, yetersiz yol bakımı, sınırlı alternatif güzergahlar ve verimli toplu taşıma seçeneklerinin eksikliği nedeniyle şiddetlenmektedir. Üretkenlik kaybı ve artan yakıt tüketimi dahil olmak üzere trafik sıkışıklığının ekonomik maliyeti önemli ölçüde büyüktür. Şehrin toplu taşıma sistemi, büyüyen nüfusunun taleplerini karşılamakta zorlanmakta olup, yetersiz, güvenilir ve aşırı kalabalık altyapıya sahiptir. Bu durum, özel araçlara veya gayri resmi ulaşım seçeneklerine bağımlı olan sakinleri, özellikle gayri resmi yerleşimler ve çeper mahallelerde yaşayanları yetersiz hizmetle karşı karşıya bırakmaktadır.

Toplu taşımanın gelişimi ve genişletilmesi için yapılan yatırımlar, Bus Rapid Transit (BRT) sistemlerinin tanıtılması ve hafif raylı veya metro seçeneklerinin araştırılması, özel araç

kullanımına verimli ve sürdürülebilir alternatifler sağlayabilir. Bisiklet, yürüyüş ve elektrikli araçlar gibi sürdürülebilir ulaşım modlarının kullanımı teşvik edilerek çevresel etkiler hafifletilebilir ve kentsel yaşam iyileştirilebilir. Yol altyapısının iyileştirilmesi, akıllı trafik yönetim sistemlerinin uygulanması ve gayri resmi ulaşım hizmetlerinin şehir genelindeki ulaşım planlamasına entegrasyonu, daha uyumlu ve verimli bir ulaşım sistemine katkıda bulunabilir.

Abidjan'ın yolları kötü durumdadır, sık sık çukurlar vardır ve bakım yetersizdir. Yüksek trafik alanları etrafında alternatif güzergahların ve çevre yollarının eksikliği, darboğazlara katkıda bulunur ve bu da önemli ekonomik kayıplara yol açar. Trafik sıkışıklığı, sera gazı emisyonlarının ve kirleticilerin artmasına da katkıda bulunur ve hava kalitesini olumsuz etkileyerek çevresel bozulmaya yol açar. Şehir genişledikçe, seyahat mesafeleri artmış ve nüfus, iş yerlerinden uzaklaşmıştır. Trafik sıkışıklığını ele almak için, altyapı geliştirme, verimli toplu taşıma, sürdürülebilir kentsel planlama ve alternatif ulaşım modlarını içeren çok yönlü bir yaklaşım gereklidir. Hükümet yetkilileri, özel sektör ve uluslararası ortaklar arasında işbirliği, etkili çözümlerin uygulanması ve Abidjan'da kentsel hareketliliğin iyileştirilmesi için kritik öneme sahiptir.

Ulaşım sistemleri, kentsel gelişim ve toplumsal refahta kritik bir rol oynar ve mal, hizmet ve insan akışını kentsel alanlar içinde ve arasında destekler. Abidjan gibi Sahra Altı şehirlerinde sosyal dışlanma ve ulaşım arasındaki bağlantı yeterince araştırılmamış olup, ulaşım politikası ile ilgili potansiyel endişeleri vurgulamaktadır.

Abidjan'daki ulaşım sektörü, demiryolları, karayolları, su yolları ve hava taşımacılığı gibi çeşitli ulaşım modlarını içeren karmaşık ve çeşitlidir. Yol ağı, Abidjan ulaşım sisteminde baskın bir rol oynar ve yolcu ve yük hareketlerinin çoğunluğuna hizmet eder. Ulaşım sektörü, trafik sıkışıklığı, yetersiz altyapı ve toplu taşımaya yetersiz yatırım gibi zorluklarla karşı karşıyadır.

4. Araştırma Yöntemi ve Tasarımı

Araştırmanın amacı

Bu araştırma, TRSE'nin Abidjan'daki ekonomik, kültürel ve sosyal bağlam içindeki rolünü anlamayı amaçlamaktadır. Araştırma, Abidjan'daki toplu taşımanın mevcut durumunu değerlendirmeyi, en çok etkilenen nüfusları belirlemeyi, TRSE'nin günlük hareketlilik ve faaliyetlere katılım üzerindeki etkisini analiz etmeyi ve TRSE'yi azaltmak için politika ve planlama çözümlerini keşfetmeyi amaçlamaktadır.

Araştırmanın önemi

Ulaşım sistemleri, dünya genelinde şehirlerin ekonomik ve sosyal gelişiminde kritik bir rol oynamaktadır ve gelişmekte olan ülkelerde, ulaşım mevcudiyeti ile sosyal dışlanma arasındaki etkileşim benzersiz bir zorluk sunmaktadır. Fildişi Sahili'ndeki Abidjan, bu dinamiklerin analizi için örnek bir vaka sunmaktadır çünkü şehir hızlı kentleşme yaşamakta ve çeşitli nüfusa eşit ulaşım seçenekleri sunma konusunda benzersiz zorluklarla karşı karşıya kalmaktadır.

Araştırma soruları ve hipotezler

Araştırma soruları, sosyoekonomik durum ve coğrafi konumun Abidjan'daki TRSE üzerindeki etkisini anlamaya odaklanmaktadır ve bu mekanizmaların etkilenen nüfusların günlük yaşamlarında nasıl tezahür ettiğini incelemektedir. Bu tezi destekleyen hipotezler şunlardır:

1. Kadınların ev dışı faaliyetlere katılımı, toplu taşımada güvenlik algıları nedeniyle erkeklere göre önemli ölçüde daha düşüktür.
2. Daha düşük gelire sahip bireyler, aylık gelirdeki artış ile bu tür faaliyetlere katılım sıklığı arasındaki doğrudan ilişki nedeniyle ev dışı faaliyetlere daha az sıklıkla katılırlar.
3. Özel araç sahibi hanelerden gelen bireyler, özel ulaşımı olmayanlara kıyasla faaliyetlere daha yüksek sıklıkta katılırlar.
4. Yaşlılar, kadınlar, engelli bireyler ve çocuklar gibi kırılgan nüfus grupları, diğer demografik gruplara göre toplu taşımayı daha az sıklıkla kullanırlar.
5. Daha az eğitilmiş bireyler faaliyetleri kaçırma veya iptal etme olasılığı daha yüksekken, daha yüksek eğitim seviyesine sahip olanlar günlük ulaşım için özel araçları tercih etmektedir.
6. Çeperdeki veya gayri resmi yerleşimlerde yaşayanlar, merkezi/zengin mahallelerde yaşayanlara kıyasla ev dışı faaliyetlere daha az katılmaktadır.
7. İşyerlerine daha uzak yaşayan insanlar, toplu taşıma araçlarına daha bağımlı olup ev dışı faaliyetlere daha az katılmaktadır.

Araştırma metodolojisi

Bu çalışma, Sahra Altı Afrika'da bir şehir olan Abidjan'da ulaşım ve sosyal dışlanma arasındaki ilişkiyi anlamayı amaçlamaktadır. Konunun karmaşıklığına rağmen, TRSE'yi değerlendirmek için tek bir yöntem belirlenmemiştir. Çalışma, ulaşım erişilebilirliğinin sosyal dışlanmayı nasıl etkilediğine dair kapsamlı bir anlayış sağlamak için nicel ve nitel araştırma yöntemlerini birleştiren karma yöntem yaklaşımını kullanmaktadır. Araştırma, günlük faaliyetlere katılım ve çeşitli ulaşım faktörlerinin bireysel faaliyet katılımı üzerindeki etkisine odaklanmaktadır. Çalışma, ulaşım dezavantajı ve sosyal dışlanmanın karmaşık kavramlarını ele alarak veri analizinde ve modellemede basitlik ve netliğe öncelik vermektedir.

Çalışma, TRSE dinamiklerini araştırmak için Ulaşım Talebi Üzerine Hanehalkı Anketi'ni (EDT) kullanmıştır, ancak 2013 anketi ayrıntılı bir araştırma için sınırlamalara sahipti. Karma yöntem araştırma tasarımı, Abidjan'daki TRSE'nin karmaşıklıklarını araştırmak için seçilmiştir. Çalışma, 18 yaş ve üstü 402 sakininden oluşan tabakalı bir örneklem kullanmakta olup, demografik bilgiye, ulaşma erişim, ulaşımın uygun fiyatlılığı, ulaşımın mevcudiyeti, ulaşımın kabul edilebilirliği ve ulaşımın günlük faaliyetler üzerindeki etkisine odaklanmaktadır. Anket, demografik bilgi, seyahat alışkanlıkları, cinsiyet ve sosyal dışlanma hakkında bölümler içermektedir.

Veri toplama, yüz yüze görüşmeler ve kağıt anketler yoluyla gerçekleştirilmiş olup, Abidjan'ın farklı bölgelerinden katılımcılara ulaşılmıştır. 10 katılımcı ile yapılan yarı yapılandırılmış görüşmeler, nicel verilere bağlam ve ilginç anlatılar eklemiştir. Anket, iki dalga halinde (402 anket) gerçekleştirilmiş ve her dalga, şehrin 10 karışık bölgesinden 201 anket ile örneklemin yarısını kapsamıştır.

Anketlerden elde edilen veriler dijitalleştirilmiş ve SPSS veya benzeri bir istatistiksel yazılım paketi kullanılarak analiz edilmiştir. Tanımlayıcı istatistikler verilerin genel bir görünümünü sağlarken, çıkarımsal istatistikler TRSE faktörleriyle ilişkili hipotezleri test etmiştir. Ki-kare testleri ve lojistik regresyon gibi analiz yöntemleri kullanılarak demografik faktörler ve TRSE arasındaki ilişkiler belirlenmiştir.

On katılımcı ile şehir planlamacıları, ulaşım yetkilileri, STK temsilcileri ve topluluk liderleri gibi anahtar bilgi sağlayıcılarla yapılan görüşmeler, Abidjan'ın ulaşım sistemi ve politikaları hakkında uzman içgörülerini sağlamıştır. Nitel veriler, sözel olarak transkribe edilmiş ve tematik analiz kullanılarak analiz edilmiştir.

Çalışma, TRSE'yi Abidjan'da anlamak için nicel anket verileri ile odak gruplarından ve görüşmelerden elde edilen nitel içgörülerini birleştirerek üçgenleme kullanmaktadır. Nicel ve nitel yöntemlerin kombinasyonu, TRSE'nin yaygınlığını ve özelliklerini ölçmenin yanı sıra, etkilenen bireylerin yaşam deneyimlerini anlamayı sağlar, böylece hedeflenmiş müdahaleler geliştirmek için sağlam bir temel oluşturur.

Tüm katılımcılardan bilgilendirilmiş onay alınmış, çalışmanın amacı ve hakları konusunda bilgilendirilmişlerdir. Yanıtların anonimliğini ve gizliliğini sağlanmış ve katılımcılara bilgilerin yalnızca eğitim amaçlı kullanılacağı konusunda güvence verilmiştir.

5. Araştırma Bulguları ve Tartışma

Katılımcıların demografik profili

Çalışma, katılımcıların cinsiyet, yaş, eğitim düzeyi ve aylık gelir gibi demografik ayrıntılarını analiz etmiştir. Katılımcıların çoğunluğu 40-49 yaş aralığındadır ve katılımcıların çoğunluğu erkektir. Katılımcıların çoğunluğu üniversite eğitimi almış olup, yükseköğretim mezunları ve ilköğretim düzeyinde olanlardan daha düşüktür.

Sosyoekonomik özellikler

Aylık gelir değişkenlik göstermekte olup, %27.9'u 200 USD'nin altında kazanmaktadır ve yaşlılar (60 yaş ve üstü) en çok etkilenen gruptur. Sosyo-ekonomik faktörler arasında hane ve araç sahipliği, kırılgan gruplara ait olma, yaşanan mahalle türü ve evden iş yerine olan mesafe bulunmaktadır. Katılımcıların çoğunluğu gecekondu bölgelerinde yaşamaktadır ve iş yerine mesafe değişkenlik göstermektedir.

Regresyon varyansı ve güvenilirlik analizi

Regresyon analizi, bağımsız ve bağımlı değişkenler arasındaki ortak varyansı göstermektedir ve ilişki %52.9 oranında değişkenlerle açıklanmaktadır. ANOVA testi, p-değeri 0.000 ile yüksek güvenilirlik göstermektedir. Cronbach's Alpha, verilerin iç tutarlılığını ve güvenilirliğini değerlendirmiş ve tüm değişkenler dışında güvenilir bulunmuştur. Sonuçlar, çalışmanın bulgularının geçerli olduğunu ve kadınların ulaşım sektöründeki dışlanmasını anlamada gelecekteki araştırmalar için bilgi sağlayabileceğini önermektedir.

Hipotez testi

Bu çalışma, gelişmekte olan ülkelerde günlük hareketlilik ve faaliyetlere katılımı TRSE'nin rolünü incelemektedir. Çeşitli hipotezler, kadınların ev dışı faaliyetlere katılım sıklığını, düşük gelirlerin ev dışı faaliyetlere katılım üzerindeki etkisini ve kırılan grupların özel araç kullanımını test etmektedir.

Sonuçlar, kadınların hareketliliği ve sosyal katılımının ulaşım erişimi ile etkilendiğini ve düşük gelirli kadınların ev dışı faaliyetlere daha az sıklıkla katıldığını göstermektedir. Özel araç sahibi hanelerden gelen bireyler, özel ulaşımı olmayanlara kıyasla faaliyetlere daha yüksek sıklıkta katılmaktadır ve bu, ulaşım erişimindeki eşitsizlikleri vurgulamaktadır. Yaşlılar, kadınlar, engelli bireyler ve çocuklar gibi kırılan gruplar, diğer demografik gruplara göre toplu taşımayı daha az sıklıkla kullanmaktadır.

Eğitim düzeyi, faaliyet katılımı ve ulaşım tercihlerinde önemli bir rol oynamaktadır. Bir kare testi, eğitim düzeyi ile araç kullanımı arasında anlamlı bir fark bulmuştur ve bu da ulaşım tercihleri ve erişim üzerinde eğitimin etkisini göstermektedir. Çeperdeki veya gayri resmi yerleşimlerde yaşayanlar, merkezi/zengin mahallelerde yaşayanlara kıyasla ev dışı faaliyetlere daha az katılmaktadır ve bu da sosyal ve eğlence faaliyetlerine katılımı önemli farklılıklar olduğunu göstermektedir.

Mesafe, bireylerin toplu taşımaya bağımlılığını ve faaliyetleri kaçırma veya iptal etme olasılıklarını önemli ölçüde etkilemektedir. Evden iş yerine olan mesafe, eğitim faaliyetleri, sağlık hizmetleri faaliyetleri veya alışveriş faaliyetleri ile anlamlı bir ilişki göstermemektedir. Bu nedenle, mesafe ev dışı faaliyetleri azaltmak için önemlidir ve seyahat maliyeti, işyerine uzak yaşayan bireyler için yaşam kalitesini etkileyebilir.

Bulguların tartışması

Bu çalışma, Abidjan'daki TRSE'nin sosyoekonomik ve demografik özelliklerini incelemektedir. Katılımcıların çoğunluğu erkektir ve kadın katılımcı sayısı 162'dir. Çalışma, kadınların ev dışı faaliyetlere katılımının erkeklerle göre daha az sıklıkta olduğunu ve bunun cinsiyet teorileriyle uyumlu olduğunu bulmuştur. Kadınlar, ekonomik, sosyal ve kültürel faaliyetlere tam katılımı daha fazla engelle karşılaşmaktadır ve bu, TRSE düzeylerinin daha yüksek olmasından kaynaklanmaktadır. Bu cinsiyet eşitsizliği, Chamseddine ve Ait Boubkr'ın (2021) bulgularıyla uyumludur ve cinsiyete dayalı iş bölümünün ulaşım erişimini etkilediğini, kadınların ekonomik fırsatlarını sınırladığını ve toplu taşımaya bağımlılıklarını artırdığını öne sürmektedir.

Kadınlar, seyahat davranışlarında önemli ölçüde dezavantajlı görünmekte, ev dışı faaliyetlere daha az sıklıkla katılmakta ve daha yüksek yürüme yolculukları yapmaktadır. İşe gidip gelmenin pratik zorlukları ve ulaşım hizmetlerinin güvenilirliği gibi pratik sorunlar, kadınların iş fırsatlarına ve ek eğitim veya iş faaliyetlerine erişimini kısıtlamaktadır. Uygun fiyatlılık, ulaşımın mevcudiyeti ve kamu taşımacılığının kalitesi gibi konular, kadınların faaliyet katılımını da etkilemektedir.

Çalışma, cinsiyetin bireylerin ulaşım sistemleriyle etkileşimlerini ve ev dışı faaliyetlere katılımını önemli ölçüde etkilediğini vurgulamaktadır. Şehir ortamlarında kadınlar arasında cinsiyete dayalı ulaşım eşitsizlikleri özellikle belirgin olup, toplu taşımaya erişim konusundaki önemli engeller TRSE'yi şiddetlendirmektedir. Kültürel normlar, bakım

sorumlulukları ve güvenlik kaygıları, kadınların hareketlilik kararlarını önemli ölçüde etkileyerek, ulaşım politikası ve planlamasında bu cinsiyet spesifik zorlukların ele alınması gerektiğini vurgulamaktadır.

Çalışma, aylık gelir düzeyleri ile çeşitli faaliyetlere katılım arasında açık bir bağlantı olduğunu ortaya koymaktadır; bu, istihdam, eğitim, dini pratikler, rekreasyon, sağlık hizmetleri, alışveriş, sosyalizasyon ve kültürel ve politik etkinliklere katılımı kapsamaktadır. Bireysel yoksulluk, finansal kısıtlamalar nedeniyle bu faaliyetlere katılımı önemli ölçüde engellemektedir; bu da ulaşım erişimini sınırlamakta ve ev dışı faaliyetlerin sıklığını azaltmaktadır. Kaynakların kıtlığı ve erişilebilir ulaşımın bulunmaması, kırılgan nüfusları orantısız bir şekilde etkileyerek faaliyetlere erişimlerini kısıtlamakta ve yoksulluğu sürdürmektedir.

Hane ve araç sahipliği, ev dışı faaliyetlere katılım sıklığını artırmakta ve özel ulaşım seçeneklerinin bulunması, bağımsızlık ve hareketliliği önemli ölçüde artırarak çeşitli etkinliklere daha kolay katılım sağlamaktadır. Ancak, araç sahipliğinin eğitimle ilgili faaliyetler üzerindeki etkisi minimaldir ve bu, ulaşım erişimini veya zamanlama zorluklarını araç sahipliğinin tek başına çözüm getiremeyebileceğini göstermektedir.

Ekonomik teoriler, kişisel araçları olmayan bireylerin, mülkiyet durumlarından bağımsız olarak iş ve eğitim gibi temel faaliyetleri önceliklendirebileceklerini öne sürmektedir. Bu tutarsızlık, ulaşım eşitliği ilkesini vurgulamaktadır ve tüm vatandaşlar için tüm faaliyetlere eşit erişim sağlamayı savunmaktadır. Eşit ulaşım tesisleri ve hizmetlerinin sağlanması, çeşitli topluluk segmentlerinde kapsayıcı katılımı teşvik etmek için kritik öneme sahiptir.

Çalışma, yaşlılar, kadınlar, engelli bireyler, ekonomik zorluk yaşayanlar ve çocuklar gibi kırılgan gruplar arasında toplu taşıma kullanım sıklığını incelemektedir. Bu grupların fiziksel sınırlamalar, finansal kısıtlamalar veya yetersiz altyapı nedeniyle ulaşım erişiminde karşılaştıkları zorlukları vurgulamaktadır. Bu ihtiyaçları ele almak, uygun fiyatlılık, erişilebilirlik ve kapsayıcılığı göz önünde bulunduran kapsayıcı bir strateji gerektirmektedir.

Yüksek eğitim düzeyine sahip olanlar, özel arabaları daha fazla kullanma eğilimindedir ve bu, ulaşım tercihleri ve sosyal katılım örüntülerini etkileyen eğitim ile ulaşım arasındaki ilişkiyi göstermektedir. Bu ilişki, Cao ve ark. (2009) tarafından yapılan araştırma ile doğrulanmaktadır.

Çalışma, dezavantajlı mahallelerde yaşayan bireyler ile varlıklı bölgelerde yaşayanlar arasında sosyal ve eğlence faaliyetlerine katılımı farklılıkları incelemektedir. Analiz, mahalle türü ve bu faaliyetlere katılım arasında belirgin bir ilişki olduğunu ortaya koymaktadır ve dezavantajlı ve gecekondu bölgelerinde yaşayanlar arasında katılım oranlarının belirgin şekilde düşük olduğunu göstermektedir. Çalışma, bu farklılıkları anlamak için çevresel adalet çerçevesini önerirken, altyapı kalitesi ve kamu politikası kararlarının da kritik roller oynayabileceğini öne sürmektedir.

Sosyal sermaye teorisi, varlıklı mahallelerde yaşayan bireylerin, daha fazla kaynağa, sosyal ağlara ve rekreasyonel fırsatlara erişim sağlayarak daha yüksek düzeyde faaliyet katılımını desteklediğini öne sürmektedir. Kentsel planlama, sosyal katılım ve kapsayıcılığı teşvik etmede kritik öneme sahiptir ve dezavantajlı mahallelerin canlandırılması ve onların bağlantısının artırılması gerekmektedir.

Çalışma, Abidjan'daki düşük gelirli sakinlerin yaşamları üzerindeki toplu taşıma altyapısının etkisini araştırmaktadır. İyileştirilmiş altyapının, istihdam fırsatlarına erişimi artırabileceğini ve sosyal ve topluluk faaliyetlerine katılımı iyileştirebileceğini, sosyal dışlanma riskini azaltabileceğini ortaya koymaktadır. Araştırma ayrıca, işe gitme mesafesi ile iş dışı faaliyetleri erteleme veya iptal etme sıklığı arasındaki ilişkiyi vurgulamaktadır. Daha uzun işe gitme süreleri, toplu taşıma kullanımının azalmasına ve iş, dini, eğlence, sosyal, kültürel ve politik etkinliklere katılımın azalmasına yol açmaktadır. Çeperdeki mahallelerde yaşayan sakinler en çok olumsuz etkilenmektedir ve uzun işe gitme süreleri, artan stres, yorgunluk ve kişisel veya sosyal faaliyetler için azalan zamanla ilişkilendirilmektedir. Çalışma, Abidjan'da ulaşım dinamiklerinin sosyal dışlanmaya nasıl katkıda bulunduğunu kapsamlı bir şekilde ortaya koymakta ve şehrin çeşitli nüfusunun ihtiyaçlarını ele alan çok yönlü bir ulaşım politikasının önemini vurgulamaktadır.

Gelişmekte Olan Ülkelerde TRSE Dinamiklerinin Tartışılması: Pakistan, Meksika, Güney Afrika, Nijerya ve Fildişi Sahili Arasında Karşılaştırmalı Analiz

Bu bölüm, beş önemli gelişmekte olan ülkede Ulaşım Kaynaklı Güvenlik ve Emniyet (TRSE) dinamiklerinin karşılaştırmalı bir analizini sunmaktadır: Pakistan, Meksika, Güney Afrika, Nijerya ve Fildişi Sahili. Analiz, Küresel Güney'deki politika yapımcılar için uygulanabilir öneriler sunmayı ve bu bölgelerdeki deneyimlere dayalı olarak gelecekteki araştırmalara rehberlik etmeyi amaçlamaktadır.

Ülkeler Arasındaki Ortak Sorunlar arasında cinsiyet eşitsizlikleri, ekonomik yük ve mekansal dışlanma bulunmaktadır. Pakistan'da kadınlar, güvenlik kaygıları, sosyo-kültürel kısıtlamalar ve yetersiz ulaşım altyapısı nedeniyle ciddi hareketlilik sorunları yaşamaktadır. Meksika'da kamu taşımasındaki suç ve taciz olayları, kadınların bu hizmetleri kullanmasını engelleyerek korku temelli dışlanmaya yol açmaktadır. Nijeryalı kadınlar, özellikle Lagos'ta, güvenlik endişeleri ve aşırı ulaşım masrafları nedeniyle hayati hizmetlere erişimlerini sınırlamaktadır.

Düşük gelirli haneler, ulaşım maliyetlerinden orantısız bir şekilde etkilenmekte ve bu da kırılganlıklarını artırmakta ve temel hizmetlere erişimlerini kısıtlamaktadır. Pakistan'da yüksek ulaşım maliyetleri, Meksika'da bölgesel eşitsizlikler ve Nijerya ve Fildişi Sahili'nde yetersiz ve uygun şekilde tasarlanmamış ulaşım altyapısı, bu eşitsizlikleri daha da şiddetlendirmektedir.

Mekansal dışlanma, çeşitli ülkelerde önemli bir sorun olup, dezavantajlı topluluklar için hayati hizmetlerin ve fırsatların bulunabilirliğini sınırlamaktadır. Pakistan, Meksika ve Fildişi Sahili'ndeki çeper kentsel alanlar, önemli ulaşım dezavantajları yaşamakta ve kentsel ve ulaşım planlamasının entegrasyonu, mekansal dışlanmayı azaltmak ve tüm sakinler için erişilebilirliği artırmak için acil bir ihtiyaç olduğunu göstermektedir.

6. Sonuç ve Öneriler

Sonuç

Bu tez, Abidjan ve çevresindeki TRSE'nin karmaşıklıklarını ve bireylerin günlük yaşamdaki katılımı üzerindeki ulaşım erişimi ve kullanım kalıplarının derin etkisini araştırmaktadır. Araştırma, ulaşım davranışlarında, faaliyet katılımında, seyahat iptalleri oranlarında, ulaşım tercihlerinde ve kentsel Abidjan çevresindeki toplu taşımaya erişimdeki değişkenliği

vurgulamaktadır. Çalışma, düşük gelirli sakinler, engelliler, kadınlar ve çeper veya gayri resmi yerleşimlerde yaşayanlar gibi kırılgan demografik grupların TRSE'den özellikle etkilendiğini bulmuştur. Bu engeller, onların istihdam, eğitim, sağlık hizmetleri ve sosyal faaliyetlere erişimini önemli ölçüde kısıtlamakta ve sosyo-ekonomik bölünmeleri şiddetlendirmektedir.

Abidjan'daki TRSE'nin bireysel hareketlilik ve toplumsal katılım üzerindeki sonuçları çarpıcı olup, kişisel özgürlüğü, ekonomik büyümeyi ve sosyal eşitsizlikleri derinleştirmektedir. Yeterli ulaşım altyapısı ve hizmetlerinin eksikliği, yoksulluk ve dışlanma döngüsünü beslemekte ve bu nedenle bütüncül politika çözümleri ve kentsel planlama girişimleri gerektirmektedir. TRSE'yi Abidjan'da etkili bir şekilde ele almak için, politika reformu, altyapı iyileştirmeleri ve topluluk katılımını içeren kapsamlı bir yaklaşım gereklidir. Öneriler, çeşitli nüfus gruplarının ihtiyaçlarını dikkate alan kapsayıcı ulaşım politikalarının oluşturulması, toplu taşıma altyapısının ve hizmet verimliliğinin artırılması için yatırımlar yapılması ve en kırılgan kullanıcıları korumak için güvenlik girişimlerini içermektedir.

Sonuç olarak, bu tez, cinsiyet, gelir, kırılganlık, yaş ve yer gibi çeşitli demografik kategorilerde günlük seyahat davranışlarının karmaşıklıkları ve bunların sosyal dışlanma üzerindeki geniş etkilerini iyileştirmeye yönelik hedeflenmiş müdahalelerin ve politika önlemlerinin acil ihtiyacını vurgulamaktadır.

Öneriler

Bu tez, Büyük Abidjan Bölgesi'nde TRSE'yi ele almak için öneriler sunmaktadır. Sürdürülebilir ulaşım çözümlerini ve altyapısını, örneğin toplu taşıma sistemleri ve gayri resmi ulaşım modlarını içeren çözümlerle erişilebilirliği iyileştirmeyi ve eşitsizlikleri azaltmayı önermektedir. Otobüs ve hafif raylı sistem gibi toplu taşıma seçeneklerini genişletmek ve ulaşım yoluyla akıllı kentsel yenilemeyi teşvik etmek de önerilmektedir.

Kırılgan nüfusların özel ulaşım ihtiyaçlarını ele almak, eşit bir ulaşım sistemi oluşturmak için kritik öneme sahiptir. Yaya ve bisiklet yollarını güvenli ve iyi aydınlatılmış hale getirmek ve topluluk liderliğindeki ulaşım girişimlerini teşvik etmek, ulaşım kullanımındaki cinsiyet farkını azaltabilir.

Ulaşım politikasını sosyo-ekonomik stratejilerle entegre etmek de esastır. Düşük gelirli sakinler için toplu taşımayı daha uygun fiyatlı hale getirmek amacıyla sübvansiyon programları uygulamak veya kademeli bir ücret sistemi getirmek, sosyal dahil olmayı teşvik edebilir. Gecekondu ve düşük gelirli mahallelerde parklar, topluluk merkezleri ve rekreasyon tesislerine yatırım yapmak da sosyal dışlanmayı azaltmaya yardımcı olabilir.

Sonuç olarak, bu öneriler, kentsel hareketliliği iyileştirmeyi, erişilebilirliği artırmayı ve Büyük Abidjan Bölgesi'nde düşük gelirli ve kırılgan grupları etkileyen eşitsizlikleri azaltmayı amaçlamaktadır. Etkili ve sürdürülebilir kentsel gelişim için hükümet kurumları, yerel topluluklar ve uluslararası kuruluşlar arasında işbirliği gereklidir.

Bu araştırma, Abidjan'ın kentsel bağlamında ulaşım erişimi ile sosyal dışlanma arasındaki karmaşık ilişkiyi incelemekte ve sosyal dışlanmayı etkileyen gelir, cinsiyet, eğitim ve coğrafi konum gibi faktörlerin rolünü vurgulamaktadır. Sosyal dışlanmayı ele almak için çok boyutlu bir yaklaşım önererek, politika yapımcılar ve kentsel planlamacılar için kentsel ulaşım

sistemlerinde erişilebilirliği ve kapsayıcılığı artırmaya yönelik hedeflenmiş müdahaleler geliştirmek için kapsamlı bir çerçeve sunmaktadır.

Araştırma, ulaşım politika yapıcıları ve kentsel planlama uygulayıcıları için değerli içgörüler sağlamakta ve sosyal dahil olmayı önceliklendiren politikalar ve planlama uygulamaları oluşturma gerekliliğini vurgulamaktadır. Ayrıca, Abidjan ve benzer kentsel bağlamlarda sosyal dahil olmayı ve eşit ulaşım erişimini teşvik etmeyi savunmaktadır. Sistemik engelleri ele alarak, dezavantajlı nüfusların dışlanmasına katkıda bulunan kapsayıcı ulaşım politikalarının tüm vatandaşlara temel kaynaklara ve mesleki gelişim fırsatlarına erişim sağlamada potansiyelini vurgulamaktadır.

Bu araştırma, kentsel hareketlilik ve sosyal dışlanmanın karmaşık zorluklarını ele almak için pratik bir rehber sunmakta ve ulaşımın sosyal uyum ve eşitliği teşvik eden bir katalizör olarak rol oynadığı daha kapsayıcı kentsel ortamlar yaratmaya yönelik gelecekteki girişimlerin temelini atmaktadır.

Abidjan'daki TRSE üzerine yapılan araştırma, kentsel hareketlilik ve sosyal eşitlik arasındaki ilişkiye dair değerli içgörüler sağlamaktadır. Ancak, çalışmanın coğrafi kapsamı ve kesitsel tasarımı, diğer kentsel bağlamlara genellenebilirliğini sınırlamaktadır. Boylamsal çalışmalar, kentsel hareketlilik ve sosyal dışlanmanın evrimsel dinamikleri hakkında daha kapsamlı içgörüler sağlayabilir. Anketler yoluyla toplanan nicel veriler, TRSE ile karşılaşan bireylerin ayrıntılı deneyimlerini tam olarak yansıtmayabilir. Gelecekteki araştırmalar, kentsel hareketliliği artırmak ve sosyal dışlanmayı azaltmak için bu sistemleri nasıl kullanabileceklerini keşfederek gayri resmi ulaşım sektörüne odaklanabilir.

Gelecekteki araştırmalar, ulaşım davranışlarındaki zamansal değişimleri izlemek ve belirli kentsel ve ulaşım politikalarının sosyal dışlanma üzerindeki etkisini incelemek için boylamsal ve karşılaştırmalı çalışmalara odaklanmalıdır. Sosyoekonomik faktörler ve altyapı eşitsizlikleri, sosyal dışlanma ve ulaşım dinamiklerini nasıl etkilediğini anlamak için araştırılmalıdır. Yaşanan deneyimler, politika etkisi değerlendirmesi ve kırılmanlık ve kesişimsellik üzerine niteliksel çalışmalar, TRSE'yi daha zengin bir şekilde anlamak için keşfedilmelidir. Bu sınırlamaları ele alarak, gelecekteki çalışmalar, TRSE hakkında daha kapsamlı bir anlayış sağlayabilir ve daha kapsayıcı ve adil kentsel ulaşım sistemlerinin geliştirilmesine rehberlik edebilir.

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CONTENTS

	Page
ABSTRACT.....	iv
ÖZET	v
ACKNOWLEDGMENTS	xxi
CONTENTS.....	xxii
LIST OF TABLES.....	xxix
LIST OF FIGURES	xxxi
SYMBOLS AND ABBREVIATIONS.....	xxxv
1. INTRODUCTION.....	1
2. SOCIAL EXCLUSION AND TRANSPORT: AN IN-DEPTH REVIEW AND ANALYSIS	13
2.1. Theoretical Foundations of Social Exclusion.....	13
2.1.1. Definition, scope, and origins of social exclusion	13
2.1.2. Core theories and affected populations	15
2.1.3. Exploring the multidimensional nature of social exclusion	17
2.1.4. Contrasting social exclusion with social inclusion	19
2.2. Transport and Social Exclusion Dynamics.....	20
2.2.1. Evolutionary perspectives	21
2.2.2. The realities and underlying causes	22
2.2.3. Exclusion of vulnerable groups from public transportation.....	24
2.3. The Role of Public Transportation in Fostering Social Inclusion	26
2.3.1. Public transportation as a social equalizer or catalyst for equality	26
2.3.2. Socioeconomic participation and transport accessibility	29
2.4. TRSE: Conceptualization and Dimensions	31
2.4.1. Concept and theoretical development of TRSE	31
2.4.2. Exploring the multidimensional nature of TRSE.....	33

	Page
2.4.3. Dimensions of TRSE.....	35
2.5. Measurement of TRSE	39
2.5.1. The complexity of TRSE measurement conceptualization	39
2.5.2. Absence of consensus for TRSE measurement framework	41
2.5.3. Accessibility as a measure for TRSE	44
2.5.4. Activity-space as a measure for TRSE.....	46
2.6. Integrative Analysis of Social Exclusion and Transport Disadvantage	49
3. TRANSPORTATION DYNAMICS IN DEVELOPING COUNTRIES WITH A FOCUS ON ABIDJAN.....	53
3.1. Transportation and Socioeconomic Development.....	53
3.1.1. Historical perspective and economic opportunities	53
3.1.2. Economic growth and transport investments	55
3.1.3. Enhancing market access and attracting investment	56
3.1.4. Socioeconomic benefits.....	57
3.2. Challenges in Transportation within Developing Countries	59
3.2.1. Infrastructure inadequacies	59
3.2.2. Funding limitations	61
3.2.3. Rapid urbanization	63
3.2.4. Governance and institutional weaknesses	65
3.2.5. Environmental and social concerns.....	67
3.2.6. Informal transportation sector	68
3.3. The Urbanization Phenomenon in Sub-Saharan Africa	69
3.3.1. Drivers of urbanization in Sub-Saharan Africa.....	70
3.3.2. Impacts of urbanization.....	71
3.3.3. Strategies for sustainable urbanization.....	72
3.4. Transport Issues in African Cities	73

	Page
3.5. Transportation for Marginalized Social Groups	75
3.6. Social Exclusion and Transport Disadvantage in the Developing World	76
3.7. Côte d'Ivoire: A National Overview	78
3.7.1. General overview	78
3.7.2. Economic context and growth.....	79
3.7.3. Challenges in urban development	83
3.7.4. Transportation infrastructure.....	85
3.8. Abidjan: A Contextual Analysis.....	87
3.8.1. Demographic profile	87
3.8.2. Economic and social landscape.....	90
3.8.3. Urbanization and transport infrastructure	93
3.9. Transportation Modes in Abidjan.....	96
3.9.1. Gbaka (Mini-buses).....	97
3.9.2. Meter taxis.....	98
3.9.3. Woro-woro (Shared taxis).....	98
3.9.4. Inter-communal taxis.....	99
3.9.5. SOTRA buses.....	100
3.9.6. VTC (Vehicle for hire).....	100
3.9.7. Water buses	102
3.9.8. Pinasses (Water taxis)	103
3.9.9. Taxis motos or taxi-tricycles “saloni”	103
3.9.10. The metro d'abidjan (Abidjan metro)	105
3.9.11. Abidjan BRT project	106
3.10. Population Distribution and Opportunity Access	108
3.10.1. Population distribution patterns.....	108
3.10.2. Challenges in access to opportunities.....	108

	Page
3.10.3. Enhance opportunity access	110
3.11. Transportation Challenges in Abidjan	111
3.12. Traffic Jam in Abidjan.....	113
3.13. Agglomeration Dynamics in Abidjan.....	116
3.14. Existing Transport Facilities in the City: Between Informality and Challenges.....	121
3.15. The SDUGA Master Plan (Schéma Directeur d'Urbanisme du Grand Abidjan).....	125
3.16. Accessibility and Transport Disadvantages in Abidjan.....	128
4. RESEARCH METHOD AND DESIGN.....	133
4.1. Objective of the Research.....	133
4.2. Research Significance.....	133
4.3. The Research Questions	134
4.4. Hypotheses.....	135
4.5. The Research Methodology.....	137
4.5.1. Measuring TRSE in Abidjan.....	138
4.5.2. Research design.....	139
4.5.3. Quantitative methods.....	141
4.5.4. Qualitative methods.....	145
4.5.5. Triangulation of findings.....	146
4.5.6. Ethical considerations	146
5. RESEARCH FINDINGS AND DISCUSSION.....	149
5.1. Demographic Profile of the Respondents.....	149
5.1.1. Gender and age.....	149
5.1.2. Level of education.....	151
5.1.3. Monthly income	153
5.2. Socioeconomic Characteristics.....	154

	Page
5.2.1. Household and vehicle ownership.....	155
5.2.2. Belonging to vulnerable people.....	155
5.2.3. Type of inhabited neighborhood	156
5.2.4. Distance from home to workplace	157
5.3. Regression Analysis	158
5.4. The Analysis of Variance	158
5.5. Reliability Analysis	158
5.6. Hypotheses Testing.....	159
5.6.1. H1 - The frequency of women's participation in OOH activities is significantly lower than that of men.....	159
5.6.2. H2 - Individuals with lower incomes engage less frequently in OOH activities	172
5.6.3. H3-Individuals from households with personal vehicles participate in activities at a higher frequency compared to those without private transportation.....	181
5.6.4. H4- Vulnerable populations (the elderly, women, disabled individuals, and children) utilize public transportation less frequently than other demographic groups.	187
5.6.5. H5 - Less educated individuals are more likely to miss or cancel activities, while those with higher educational levels demonstrate a preference for private cars for daily commutes.....	190
5.6.6. H6 - Residents of peripheral or informal settlements participate less in OOH activities compared to central/well-off neighborhoods.	196
5.6.7. H7 - People living farther from their workplace are more dependent on public transport and participate less in OOH activities.....	203
5.7. Discussion of the Findings	208
5.8. Discussion of TRSE Dynamics in Developing Countries: Comparative Analysis between Pakistan, Mexico, South Africa, Nigeria, and Côte d'Ivoire	217
5.8.1. Common challenges across countries	217
5.8.2. Successful strategies.....	220
5.8.3. Major insights from comparative analysis	221

	Page
5.8.4. Actionable recommendations.....	223
6. CONCLUSION AND RECOMMENDATIONS.....	225
6.1. Conclusion.....	225
6.1.1. TRSE in Abidjan as a gender-based exclusion	227
6.1.2. TRSE as an income, education, and vehicle ownership-based exclusion	228
6.1.3. TRSE as a location-based exclusion	229
6.2. Recommendations	231
6.2.1. Incorporate sustainable, innovative transportation solutions and infrastructure	231
6.2.2. Promote smart urban renewal through transportation.....	232
6.2.3. Address vulnerability-specific transportation needs	232
6.2.4. Integrate transportation policy with socio-economic strategies.....	232
6.2.5. Periodical data collection and analysis.....	233
6.2.6. Ensure closeness of essential services and promote non-motorized transportation.....	233
6.2.7. Promote public-private partnerships (PPPs)	233
6.3. The Research Contribution.....	234
6.4. Limits and Further Research.....	235
6.4.1. Limits of the current research.....	236
6.4.2. Avenues for further research.....	236
REFERENCES	239
APPENDIXES	255
APPENDIX-1. Cancellation rate of OOH activities	256
APPENDIX-2. Cancellation rate of OOH activities based on monthly income.....	257
APPENDIX-3. Cancellation of OOH activities according to monthly income	258
APPENDIX-4. Correlation vehicle ownership and access to OOH activities	259
APPENDIX-5. Issues attending OOH activities based on vehicle ownership.....	261

	Page
APPENDIX-6. Access to OOH activity participation	262
APPENDIX-7. Activity participation based on type of inhabited neighbourhood....	264
APPENDIX-8. Means of transport based on education level	265
APPENDIX-9. Mode of access based on type of inhabited neighbourhood	266
APPENDIX-10. Mode of participation based on type of inhabited neighbourhood .	267
APPENDIX-11. Access to activities based on type of neighbourhood	268
APPENDIX-12. Activities cancelation rate based on education level	269
APPENDIX-13. Activities cancelation based on education level	270
APPENDIX-14. Activities cancelation rate based on vehicle ownership.....	271
APPENDIX-15. Survey Questionnaire.....	272
APPENDIX-16. Interview Questions	278
APPENDIX-17. Interview Answers	280
APPENDIX-18. Interview Questions	300
APPENDIX-19. Manufacturing better correlated with urbanization.....	303
APPENDIX-20. The population gap between Abidjan and other Ivorian cities has widened since 1975.....	304
CURRICULUM VITAE.....	306

LIST OF TABLES

Table	Page
Table 3.1. 2010-2025 Urban population growth in africa.....	71
Table 4.1. Measures used to identify TRSE in research studies	137
Table 4.2. Repartition of questionnaires and interviews according to commune and period	142
Table 4.3. Data sources and collection details	146
Table 5.1. Frequency of demographic details of interviewees.....	149
Table 5.2. Distribution of education level vs. gender vs. age	152
Table 5.3. Distribution of income vs. gender vs. age.....	153
Table 5.4. Frequency of socioeconomic details of interviewees	154
Table 5.5. Cronbach's Alpha analysis	159
Table 5.6. Relationship between gender and OOH activities participation	159
Table 5.7. Gender t-test on issues reducing access to activities.....	163
Table 5.8. Cancellation rate of activities based on gender.....	167
Table 5.9. Frequency of OOH activities based on monthly income	173
Table 5.10. Cancellation rate of OOH activities	177
Table 5.11. Activity participation according to vehicle ownership	182
Table 5.12. Access to OOH activities based on vehicle ownership.....	184
Table 5.13. Cancellation rate of activities based on vehicle owning	186
Table 5.14. Vulnerable people's use of public transport for OOH activities.....	189
Table 5.15. Mode of access to work activities according to education level.....	191
Table 5.16. Missing OOH events according to education level.....	192
Table 5.17. Activities cancelation rate based on education level	193
Table 5.18. Activity cancelation rate based on reason (issue)	197
Table 5.19. Correlation between neighborhood type and recreational and socializing activities participation	199

Table	Page
Table 5.20. Issues with attending recreational and socializing activities according to neighborhood	200
Table 5.21. Frequency of cancellation of events.....	200
Table 5.22. Cancellation rate of activities based on type of neighborhood	202
Table 5.23. Access to activities according to means of transport and distance	203
Table 5.24. Activities cancelation rate based on distance.....	207
Table 5.25. Key challenges and insights of TRSE in Pakistan, Mexico, South Africa, Nigeria, and Côte d'Ivoire.	219
Table 5.26. Key strategies and recommendations to mitigate TRSE in the selected five developing countries	222
Table 1. Mean scores and standard deviations of activity cancellations.....	257
Table 2. Activity cancellations according to monthly income.....	258
Table 3. Issue of access to OOH activities based on vehicle ownership	259
Table 4. Mean scores and standard deviations based on vehicle ownership	261
Table 5. Frequency in OOH activities based on gender.....	262
Table 6. Frequency in OOH activities based on neighbourhoods.....	264
Table 7. Mean scores and standard deviations based on type of neighbourhood	268
Table 8. Mean scores and standard deviations based on activities and education level.....	269

LIST OF FIGURES

Figure	Page
Figure 1.1. Research framework.....	8
Figure 2.1. Understanding social exclusion and social inclusion.....	18
Figure 2.2. Interrelation between transportation and opportunities.....	28
Figure 2.3. Relationship between transport disadvantage and social exclusion.....	51
Figure 3.1. Cumulative modal contribution to economic opportunities.....	54
Figure 3.2. Phases of development of the global economy	55
Figure 3.3. Diminishing returns of transport investments	56
Figure 3.4. Socioeconomic benefits of transportation	57
Figure 3.5. Traffic congestion in Bangalore, India	64
Figure 3.6. Projection in 769 cities urban population change between 2015 and 2025.....	70
Figure 3.7. Map of Côte d'Ivoire regions and density	79
Figure 3.8. GDP growth over the past six decades, 1961–2019.....	80
Figure 3.9. GDP growth, 2012–2018	82
Figure 3.10. Map of Abidjan District	88
Figure 3.11. Population growth 1960 -2019.....	89
Figure 3.12. Public transport modes in Abidjan.....	95
Figure 3.13. Gbaka minibuses	97
Figure 3.14. Meter taxis.....	98
Figure 3.15. Woro-woro	98
Figure 3.16. Inter-communal taxis	99
Figure 3.17. SOTRA buses.....	100
Figure 3.18. VTC (Vehicle for hire).....	101
Figure 3.19. Water buses	102
Figure 3.20. Pinasses (Water taxis)	103

Figure	Page
Figure 3.21. Taxi-tricycles “saloni”	104
Figure 3.22. Construction of metro abidjan.....	105
Figure 3.23. Route and stations of the Abidjan metro.....	106
Figure 3.24. Route and location of Abidjan BRT stations	107
Figure 3.25. Interactive map of Abidjan following the paths of different bus and train lines	110
Figure 3.26. Traffic jam in Abidjan.....	114
Figure 3.27. Traffic jam in Abidjan.....	115
Figure 3.28. 1984 Map - Abidjan’s rapid urbanization process	118
Figure 3.29. 2000 Map - Abidjan’s rapid urbanization process	118
Figure 3.30. 2015 Map - Abidjan’s rapid urbanization process	119
Figure 3.31. 2021 Map - Abidjan’s rapid urbanization process	119
Figure 3.32. Map of infrastructure projects in Abidjan.....	124
Figure 3.33. Projects Map of the 2030 Greater Abidjan Master Plan	127
Figure 4.1. Methodological framework.....	140
Figure 4.2. Map of the ten sites of survey across the city	144
Figure 5.1. Age distribution.....	150
Figure 5.2. Gender distribution.....	150
Figure 5.3. Gendered profile according to the age of the respondents.....	151
Figure 5.4. Graphic for education level vs. gender vs. age	152
Figure 5.5. Graphic for income vs. gender vs. age.....	154
Figure 5.6. Graphic for household and vehicle ownership.....	155
Figure 5.7. Graphic for belonging to vulnerable people.....	155
Figure 5.8. Graphic for inhabited neighborhood	156
Figure 5.9. Graphic analysis for neighbourhood vs. gender vs. age.....	156
Figure 5.10. Graphic for distance from home to workplace.....	157
Figure 5.11. Graphic analysis according to distance vs. gender vs. age	157

Figure	Page
Figure 5.12. Frequency of activity-travel by gender	162
Figure 5.13. Issues reducing access to activities based on gender	163
Figure 5.14. Ranking of issues reducing access to transport based on gender.....	165
Figure 5.15. Activities cancelation rate based on gender	167
Figure 5.16. OOH activities cancellation based on gender	169
Figure 5.17. Choice of usual travel mode by activity.....	171
Figure 5.18. Frequency of OOH activities based on monthly income	175
Figure 5.19. Cancellation rate of OOH activities based on monthly income.....	179
Figure 5.20. Choice of transportation mode for different activities across income levels	180
Figure 5.21. Frequency of activity participation according to vehicle ownership	183
Figure 5.22. Issues attending OOH activities based on vehicle ownership.....	184
Figure 5.23. Activities cancelation rate based on vehicle ownership.....	187
Figure 5.24. Activities cancelation rate based on education level.....	195
Figure 5.25. Access to activities based on the type of neighborhood	201
Figure 5.26. Activities cancelation rate based on type of neighborhood	202
Figure 5.27. Activities cancelation rate based on distance.....	208
Figure 1. Cancellation rate of OOH activities based on monthly income.....	256
Figure 2. Bar chart - mode of access based on education level.....	265
Figure 3. Bar chart - Frequency of “Work” participation based on type of inhabited neighbourhood	266
Figure 4. Bar chart - Frequency of “Socializing” participation based on type of inhabited neighbourhood.....	267
Figure 5. Line Chart for Frequency of activities cancelation based on education level.....	270
Figure 6. Line Chart for Frequency of OOH activities based on monthly income	270
Figure 7. Activities cancelation rate based on vehicle ownership.....	271
Figure 8. Manufacturing correlated with urbanization rates	303

Figure	Page
Figure 9. The population gap between Abidjan and other Ivorian cities has widened since 1975.....	304
Figure 10. Planning cycle for a Sustainable Urban Mobility Plan	305



SYMBOLS AND ABBREVIATIONS

The symbols and abbreviations used in this study, along with their descriptions, are presented below.

Symbols	Explanations

\$	US Dollar
km	Kilometer
km ²	Square kilometers
m	Meter
m ²	Square meters

Abbreviations	Description

BAD	Banque Ouest-Africaine de Développement (African Development Bank Group)
BCEAO	Banque Centrale des Etats de l'Afrique de l'Ouest (Central Bank)
BOAD	Banque Africaine de Développement (West African Development Bank)
BRT	Bus Rapid Transit
CBD	Central Business District
CFAF	Communauté Financière Africaine Franc (Currency)
DGI	Direction Générale des Impôts (Tax Administration)
ECOWAS	Economic Community of West African States
ENV	Enquête Niveau de Vie des Ménages (Household Survey)
GAA	Greater Abidjan Area
GDP	Gross domestic product
ICT	Information and communication technology
IDB	Islamic Development Bank
IMF	International Monetary Fund

Abbreviations	Description
INS	Institut National de la Statistique (National Statistics Institute)
JICA	Japan International Cooperation Agency
KOICA	Korea International Cooperation Agency
MCC	Millennium Challenge Corporation
MCLU	Ministère de la Construction, du Logement et de l'Urbanisme (Ministry of Construction, Housing and Urban Planning)
MDG	Millennium Development Goal
MRT	Mass Rapid Transit
OIC	Office Ivoirien des Chargeurs (Ivorian Office of Shippers)
OIF	Organisation Internationale de la Francophonie (International Organisation of La Francophonie)
OOH	Out-of-home
PAA	Port Autonome d'Abidjan (Autonomous Port of Abidjan)
PUD	Plan d'Urbanisme détaillé (Detailed Urban Plan)
RandD	Research and Development
RGPH	Recensement Général de la Population et de l'Habitat (Population and Housing Census)
SDUGA	Schéma Directeur d'Urbanisme du Grand Abidjan (Greater Abidjan Master Plan)
SE	Social Exclusion
SEU	Social Exclusion Unit
SONATT	Société Nationale des Transports Terrestres (National Land Transport Company)
SOTRA	Société des Transports Abidjanais (Abidjan Transport Company)
SSATP	Sub-Saharan Africa Transport Policy Program
TRSE	Transport-Related Social Exclusion
UEMOA	Union Économique et Monétaire Ouest-Africaine (West African Economic and Monetary Union)
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization

Abbreviations	Description
USAID	United States Agency for International Development
WB	World Bank
WEF	World Economic Forum



1. INTRODUCTION

Contextualization

In urban studies and transportation research, the relationship between social exclusion and transport is of great importance, as it influences mobility and opportunities for individuals. TRSE has emerged as a critical concern in urban planning and social policy discourse, affecting cities worldwide. TRSE occurs when inadequate transport systems restrict individuals' access to essential services, employment opportunities, and social networks, disproportionately impacting marginalized communities. This phenomenon contributes to a cycle of poverty and isolation, hindering economic development and social cohesion.

Globally, the significance of TRSE has been acknowledged across the world in both developed and developing contexts, where the challenges and manifestations of TRSE differ considerably. In developed countries, the focus has often been on the affordability and accessibility of transport for low-income, the elderly, and disabled populations (Lucas, 2012). Lucas's seminal work underscores the multidimensional nature of TRSE, linking it to broader issues of urban mobility, land use planning, and socio-economic inequality.

In contrast, Sub-Saharan Africa (SSA) faces unique transport challenges due to rapid urbanization, limited infrastructure development, and socio-economic disparities. However, there is less research on TRSE in African cities like Abidjan despite the extensive attention given to TRSE experiences in the other parts of the world (Church et al., 2000; Lucas, 2012; Adeel, 2016). These regions experience a stark dichotomy between the urban elite and the urban poor, with the latter often residing in peripheral areas with poor access to efficient public transport (Pojani and Stead, 2015). This disparity exacerbates social exclusion by limiting access to economic opportunities, healthcare, education, and other critical services. Pojani and Stead's analysis of transportation equity in African cities highlights the urgent need for inclusive transport policies that address the needs of marginalized populations. This gap in research is both critical and concerning : and it needs to be filled due to the fundamental role that transportation plays in people's social participation, access to services, and quality of life (Currie and Stanley, 2008)

Over the past decades, Abidjan, the economic capital of Côte d'Ivoire has experienced rapid urbanization, resulting in many transport and accessibility challenges (Banister, 2005), epitomizing the challenges faced by many SSA cities. Rapid population growth and urban sprawl have outpaced the development of public transport systems, leaving large segments of the population without reliable access to transportation. Bande and Kaplan (2023) provide a detailed examination of Abidjan's transport issues, emphasizing the link between inadequate public transport and increased social exclusion among vulnerable groups.

Furthermore, the socio-economic impact of TRSE in Abidjan is significant. Limited mobility restricts participation in the labor market, access to education and healthcare, and engagement in social and cultural activities, which are essential for individual well-being and societal progress (Bande and Kaplan, 2023). Their research on women's mobility and social exclusion in African cities sheds light on the critical role of transport in achieving sustainable urban development and social equity.

Formulation of the research problem

Abidjan, as the economic hub of Côte d'Ivoire, has experienced significant population growth and urban expansion in recent decades. This rapid urbanization has not been matched by commensurate developments in public transport infrastructure, leading to widespread accessibility issues. The majority of Abidjan's residents rely on an informal transport sector that is often unreliable, unsafe, and unaffordable for the most vulnerable populations, including women, the elderly, the disabled, and low-income households.

The issue of TRSE in Abidjan, manifests uniquely, reflecting the city's rapid urbanization, infrastructure constraints, and socio-economic disparities. Abidjan faces a multifaceted TRSE problem that is impacted by a variety of factors, including rapid urbanization, socioeconomic disparities, infrastructure development, and neighborhood spatial characteristics (Cervero and Kockelman, 1997; Mbara and Celliers, 2013). Rapid growth in the city has led to an expansion of informal neighborhoods on the periphery which are typically poorly served by public transportation (Pojani and Stead, 2015). This urban fringe, traditionally characterized by a lack of transport connections and long distances from city centers, is often home to low-income and marginalized populations, causing their further exclusion from society (Cass et al., 2005; Banister, 2005).

The specific problem of TRSE in Abidjan can be broadly categorized into issues of accessibility, affordability, safety, and reliability:

- **Accessibility:** Many areas, especially informal settlements on the city's peripheries, lack adequate access to public transportation. This spatial mismatch between where people live and where they can access employment, education, and services exacerbates social exclusion.
- **Affordability:** The cost of transportation in Abidjan can consume a significant portion of household income, particularly for low-income families, restricting their mobility and access to essential services (Pojani and Stead, 2015).
- **Safety and Reliability:** The informal transport sector, while filling the gap left by inadequate formal public transport services, often falls short in terms of safety and reliability. Reports of accidents, overcrowding, and crime associated with informal transport modes are common, deterring their use, especially among vulnerable groups (UN-Habitat, 2013).
- **Institutional and Policy Framework:** The lack of a coherent urban transport policy and institutional framework further complicates the issue. Fragmented responsibilities among various government agencies and the absence of an integrated approach to transport planning and management hinder efforts to address TRSE effectively (Cervero and Golub, 2007).

Limited mobility restricts access to economic opportunities, educational and health facilities, and social networks, perpetuating cycles of poverty and exclusion among the city's most vulnerable populations (Lucas, 2012). These specific problems of TRSE in Abidjan have profound implications for social inclusion and urban sustainability; emphasizing its implications on the urban poor and the barriers it poses to achieving sustainable urban development and equitable social inclusion. Some studies typically focus on a few specific elements such as affordability or accessibility rather than examining the entire situation holistically. Moreover, TRSE has not been fully explored in Abidjan taking into account local socio-cultural aspects, such as gender, vulnerability, and age dynamics (Hanson, 2010). Understanding the interaction of these variables with transportation is essential to understanding the full scope of the TRSE issue.

Abidjan's transport lacks an in-depth and comprehensive analysis of the related social exclusion, which takes into account a variety of factors at different levels, such as demographics, socioeconomics, spatial patterns, transportation characteristics, and cultural venues.

Research objectives and questions

The research aims to provide a comprehensive understanding of TRSE in Abidjan, identify the most affected populations, and suggest targeted interventions to mitigate these challenges. Exploring the nuanced interplay between transportation access disparities and social exclusion in Abidjan, this thesis focuses on the role of TRSE within the city's economic, cultural, and social fabric. It seeks to understand public transportation dynamics, individuals' perceptions of exclusion, and the impact of TRSE on daily mobility and participation in activities. It examines how TRSE is impacted by socioeconomic and spatial factors in a developing city like Abidjan, including how accessibility, affordability, availability, and acceptability of transportation services affect diverse social groups.

The following objectives and questions guide this inquiry:

Research objectives

- To assess the current state of public transportation in Abidjan: Evaluate the accessibility, affordability, safety, and reliability of public transport systems to understand how these factors contribute to TRSE;
- To identify populations most affected by TRSE: Determine which demographic groups are most vulnerable to social exclusion due to inadequate transportation, focusing on income level, age, gender, and physical ability;
- To analyze the impact of TRSE on access to essential services: Examine how limitations in the public transport system affect access to employment, education, healthcare, and social activities;
- To explore policy and planning solutions to reduce TRSE: Identify and evaluate current transport policies and planning practices in Abidjan, proposing recommendations for more inclusive transportation planning.

Research questions

- What is the current state of public transportation in Abidjan, and how does it contribute to TRSE?

This question seeks to dissect the operational realities of Abidjan's public transport system, focusing on its capacity to meet the diverse needs of the urban populace.

- Which demographic groups are disproportionately affected by TRSE in Abidjan, and what are the specific challenges they face?

By identifying the most vulnerable groups, this question aims to highlight the intersections between transportation inequities and broader social vulnerabilities.

- How does TRSE impact individuals' access to employment, education, healthcare, and social participation in Abidjan?

This inquiry delves into the tangible effects of transportation barriers on daily life and societal engagement, mapping the broader socio-economic repercussions of TRSE.

- What policies and planning practices can be implemented or improved to mitigate TRSE in Abidjan, and how can these interventions promote more inclusive urban mobility?

Focusing on solutions, this question explores actionable strategies and policy interventions that can address the identified challenges and foster a more equitable transportation system in Abidjan.

The exploration of the TRSE phenomenon in Abidjan is underpinned by these specific research objectives and questions that unravel the complexities of urban mobility and its implications for social inclusion. It provides a comprehensive understanding of TRSE in Abidjan, its implications, contributing factors, and societal impact to suggest solutions to promote social inclusion and accessible and equitable transportation.

Significance of the study

The significance of addressing TRSE in developing cities like Abidjan lies in its potential to enhance urban mobility, promote social equity and inclusion, and facilitate sustainable urban development. This study contributes to the understanding of TRSE in the context of rapid urbanization and suggests policies and practices that can mitigate its impacts by:

- **Enhancing urban mobility and accessibility:** Mitigating TRSE is crucial for enhancing urban mobility and accessibility, key drivers of economic growth and social development. In developing cities, where public transportation systems are often underdeveloped or inefficient, a significant portion of the population may be excluded from accessing essential services and opportunities (Gwilliam, 2003). Addressing TRSE in Abidjan can lead to more inclusive urban planning and transportation policies that prioritize the needs of all citizens, including the most vulnerable groups.
- **Promoting social equity and inclusion:** Addressing TRSE is integral to promoting social equity and inclusion. In cities like Abidjan, where disparities in access to transportation can exacerbate existing social and economic inequalities, targeted interventions can help bridge these gaps. By ensuring that transportation systems are accessible, affordable, and safe for all, cities can take a significant step toward reducing social exclusion and enhancing the quality of life for disadvantaged communities (Lucas, 2011).
- **Facilitating sustainable urban development:** The pursuit of sustainable urban development is closely tied to the effectiveness of a city's transportation system (Cervero and Golub, 2007). Developing cities facing rapid urbanization, such as Abidjan, must address TRSE to ensure that growth is inclusive, environmentally sustainable, and economically beneficial for all residents. Integrating social equity into transportation planning and policy can contribute to more resilient and sustainable urban environments.

The critical importance of this study focuses on the potential impacts of mitigating TRSE on urban development, social equity, and the overall well-being of urban populations in the context of rapidly urbanizing cities in the developing world. By focusing on Abidjan, the research provides valuable insights that apply to other developing cities facing similar challenges.

Research framework

The exploration of TRSE in Abidjan is identified as a crucial field of inquiry. It focuses on the exploration of how transportation infrastructures and policy decisions may inadvertently exclude specific population groups, denying them access to essential services, job opportunities, and social participation in the urban environment. Understanding and quantifying TRSE in this context necessitates a holistic approach, integrating quantitative and qualitative methodologies to capture the intricate dynamics by which transportation systems influence social inclusion. Therefore, this thesis outlines a comprehensive roadmap to systematically explore TRSE within Abidjan.



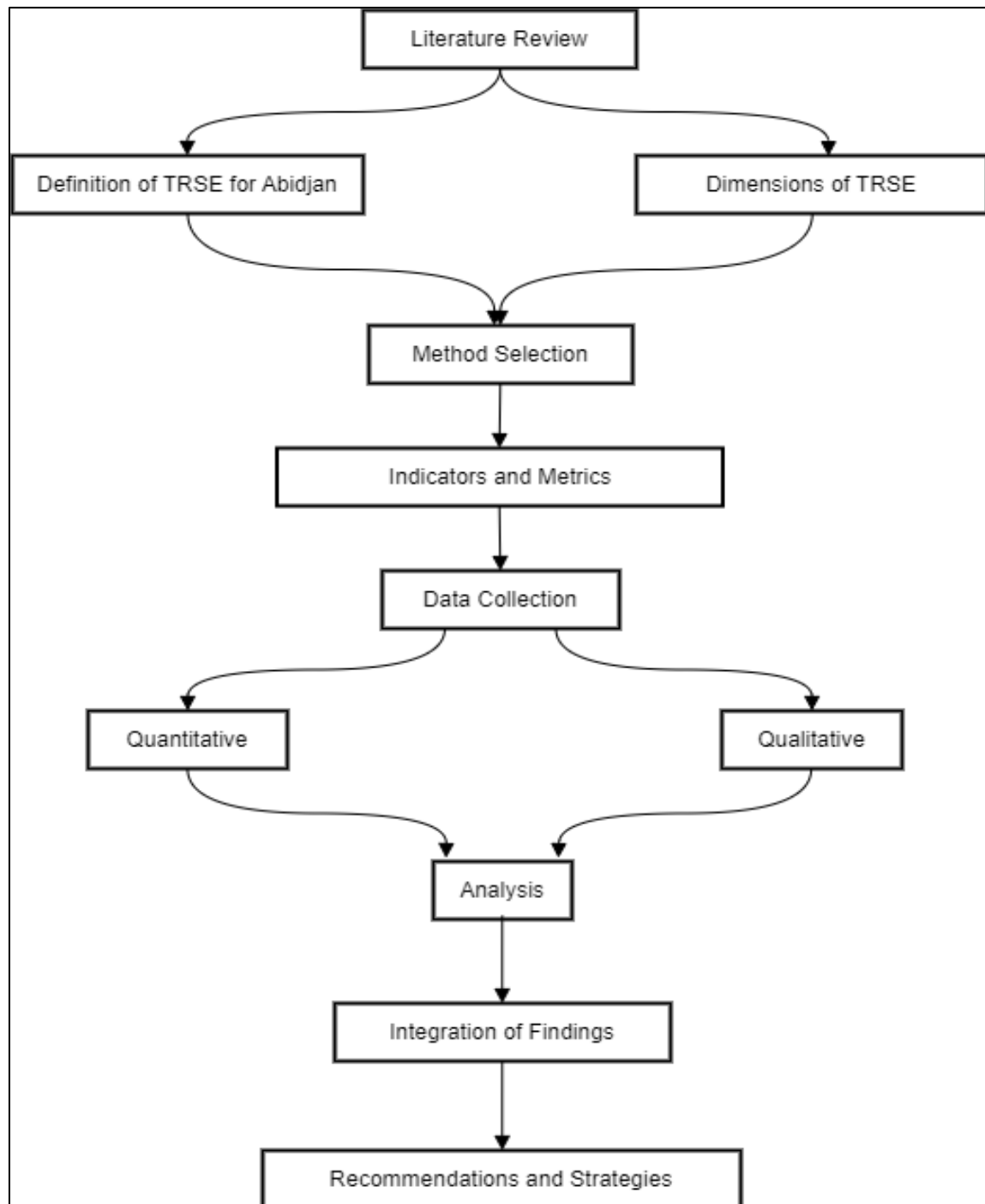


Figure 1.1. Research framework

Literature review

The literature review rigorously examines existing theoretical frameworks, methodological approaches, and empirical findings pertinent to TRSE, aiming to contextualize and elucidate its implications within the urban setting of Abidjan. This process involves:

- An exhaustive search through scholarly databases to collate studies focusing on TRSE, alongside related concepts such as accessibility, mobility, and social equity.
- A critical review of policy documents and case studies across diverse geographic locales to pinpoint factors exacerbating TRSE.
- A comprehensive synthesis of the gathered insights to unveil literature gaps and ascertain potential methodological approaches for TRSE assessment.

Definition and dimensions of TRSE for Abidjan

Based on the literature review, this segment delineates a precise definition and outlines the scope of TRSE within the purview of this research, focusing on Abidjan. It involves:

- Formulating a comprehensive definition of TRSE, identifying its critical dimensions and indicators.
- Specifying the geographic and demographic parameters of the study to ensure targeted and relevant inquiry.
- Enumerating the specific elements of transportation and social exclusion under investigation, thereby facilitating precise measurement and analysis.
- This systematic approach ensures the research is grounded in a robust conceptual framework, tailored to the urban context of Abidjan.

Method selection

In this section, a multifaceted methodological framework is constructed for the empirical investigation of TRSE, leveraging both:

- Quantitative Methods: Implementation of structured surveys and analysis of existing datasets to quantify aspects of accessibility, mobility patterns, and unmet transportation needs.
- Qualitative Methods: Execution of in-depth interviews, focus group discussions, and case studies to delve into personal narratives and experiences about TRSE.
- Mixed Methods: Integration of quantitative and qualitative insights to furnish a holistic understanding of TRSE dynamics.

This triangulated methodological strategy enriches the research by accommodating diverse perspectives and data sources.

Data collection

This part entails the systematic collection of data concerning transportation systems, their utilization, accessibility, and associated demographic and socio-economic variables through:

- Acquiring quantitative data via surveys, official statistics, and records of transportation usage.
- Compiling qualitative insights through targeted interviews and focus groups with communities impacted by TRSE.

This comprehensive data collection strategy is foundational for analyzing the multifaceted nature of TRSE in Abidjan.

Data analysis

The analysis phase involves the meticulous examination of gathered data to uncover trends, disparities, and contributing factors to TRSE by:

- Employing advanced statistical software to process quantitative data, searching for patterns and correlations between transportation access and indicators of social exclusion.
- Applying thematic analysis to qualitative data to distill prevalent themes and narratives surrounding TRSE.
- Synthesizing insights from both quantitative and qualitative datasets to construct an integrated overview of TRSE in Abidjan.

This analytical approach facilitates a nuanced understanding of the factors driving TRSE in the urban context.

Reporting and recommendations

This final segment focuses on articulating the research findings and formulating recommendations to ameliorate TRSE, encompassing:

- Drafting an exhaustive report that delineates the study's methodology, key findings, and analytical insights.
- Proposing targeted policy recommendations designed to enhance transportation accessibility and inclusivity, thereby mitigating TRSE.
- Disseminating the research outcomes through scholarly articles, policy briefs, and engagements with relevant stakeholders.

By communicating the insights and advocating for informed interventions, this research aims to contribute to the reduction of TRSE in Abidjan.

Structure of the dissertation

This dissertation is organized into six main sections, encompassing an introduction, background and literature review, an overview of the study city, research design, and methodology, an analysis of transportation issues, survey results and discussion, and finally, the conclusion and recommendations. Each section is summarized as follows:

- **Part 1: Introduction:** This initial section outlines the scope, significance, and contributions of the research. It sets the context by delineating the research objectives, motivations, and the broader implications of the study.
- **Part 2: Background and Literature Review:** An extensive review of the literature provides a deep dive into the global perspective on social exclusion and its interplay with transportation. It synthesizes findings from prior studies to offer a nuanced understanding of the issue worldwide.
- **Part 3: Overview of the Study City:** Focused on the transport ecosystem in developing countries, this part zooms in on the urbanization of Sub-Saharan Africa, with a specific look at Côte d'Ivoire and the Greater Abidjan Area (GAA). It includes a macro-level analysis of Abidjan's public transport system, urban growth, and transportation sector. The discussion extends to the identification of transport-related opportunities, challenges, and the potential for social exclusion in Abidjan.
- **Part 4: Research Design and Methodology:** This section elaborates on the research objectives, questions, hypotheses, analytical methods, and the design and execution of the survey and data collection.

- Part 5: Survey Results and Analysis of Transportation Issues: Presenting findings on TRSE and individual mobility within the city, this part examines the data at a micro-level. It discusses the outcomes of hypothesis testing and provides an analysis of daily travel behaviors across various socio-economic groups. This part also presents a TRSE comparative analysis in five (5) case studies of developing countries: Pakistan, Mexico, South Africa, Nigeria, and Côte d'Ivoire. It aims to offer actionable recommendations for policymakers in the Global South, but also provide a guide for future research by identifying common challenges and what works based on the experience in those regions across continents.
- Part 6: Conclusion and Recommendations: The final section synthesizes the insights gained regarding daily travel behavior and the character of TRSE as influenced by gender, income, vehicle ownership, and geographic location. It offers targeted recommendations for enhancing public transport in Abidjan to foster greater inclusivity. The section concludes by highlighting the study's limitations and suggesting directions for future research.

Given the nascent state of research on TRSE in Côte d'Ivoire and its limited exploration in Sub-Saharan Africa, this study encounters various challenges, including contextual constraints and the scarcity of relevant data and documentation.

2. SOCIAL EXCLUSION AND TRANSPORT: AN IN-DEPTH REVIEW AND ANALYSIS

This literature review meticulously examines the intricate relationship between transportation and social exclusion within societal contexts. Drawing from an extensive compilation of global studies, the review is thematically organized, eschewing a linear approach in favor of a structured, synthetic, and critical analysis. It is imperative to offer a nuanced exploration that captures the multifaceted dimensions of social exclusion, including its diverse definitions across various disciplines and its historical underpinnings. Such a comprehensive examination is crucial for laying a robust theoretical groundwork that elucidates the complex dynamics between social exclusion and transportation.

2.1. Theoretical Foundations of Social Exclusion

2.1.1. Definition, scope, and origins of social exclusion

Social exclusion represents a broad and intricate process of exclusion of persons or groups from certain resources or offers that are recognized as fundamental and crucial for social integration (Silver, 1994). Unlike mere economic deprivation or poverty, social exclusion spans a broader spectrum, encapsulating not only financial hardship but also discrimination, restricted access to healthcare and education, and diminished involvement in civic life (Atkinson, 1998). To better address the challenges social exclusion poses to social cohesion and individual well-being, researchers and policymakers must understand and take into account its multidimensional character, historical development, complex nature and broad spectrum of issues it encompasses.

The term "social exclusion" has evolved since its initial introduction by Rene Lenoir in 1974, with varying definitions highlighting its role as a barrier to full societal participation (Social Exclusion Unit [SEU], 2003). Originating in France during the early 1970s, the concept initially aimed to identify those unprotected by traditional social security measures, such as the unemployed, disabled individuals, and the elderly, underscoring the state's failure to include marginalized groups (Room, 1995; Turdalieva and Edling, 2017). Over time, the scope of social exclusion has broadened, encompassing issues of societal integration, cohesion, and the marginalization of diverse groups (Castel, 1995).

By the 1990s, social exclusion had emerged as a prominent concept within European Union social policy, advocating for more inclusive social policies to address the multi-dimensional nature of poverty and exclusion. The EU's adoption of the term signified a shift towards creating more cohesive societies through comprehensive policy measures, recognizing social exclusion as a result of interconnected issues like unemployment, inadequate education, low income, poor housing, and health disparities (Hine and Mitchell, 2001; Daly, 2006; Lucas, 2012). According to Lucas (2012), in 1997 Britain's government created the interagency SEU to fight social exclusion. In 1994, then-President Clinton introduced 'environmental justice' to the U.S. This holistic view underscores social exclusion as not merely a consequence of economic factors but a wider spectrum of barriers impacting individuals' quality of life and societal participation. They state in their study that a person is socially excluded if he or she fails to take part in the usual activities of citizens in the community in which they live.

Comprehensive definitions of social exclusion, such as the one provided by the Commission of the European Communities (1999), highlight its nature as stemming from multiple, changing factors that prevent individuals from engaging in normal societal exchanges, practices, and rights. This perspective acknowledges social exclusion as impacting not only the impoverished but also those disadvantaged by inadequate housing, education, health, and access to services. It emphasizes the role of discrimination, segregation, and social infrastructure weaknesses in perpetuating a two-tier society. This definition adequately highlights the multidimensional nature of the problem and the failure of the state to protect the vulnerable. Using this definition, Adeel (2015) discusses the (non-stated negative) consequences of multiple problems (personal financial, and environmental). For him, social exclusion is the idea of individuals being unable to live like normal 'others' in the community due to social and economic issues.

Walker and Walker (1997) define social exclusion as "the process of being excluded from any of the economic, social, political, and cultural systems that define an individual's social integration." According to Sen (2000), social exclusion refers to the unfortunate situation of those who are unable to live like other commons in their community and whose condition is undesirable, sympathetic, and deserving of assistance from the government and society. Due to their limited participation in economic, social, political, and cultural events, they are wholly or partially detached from their society. Rather than helping the poor and ignoring

any problems other than financial, exclusion became seen as an ineffective welfare state, which prompted people to demand policies to 'socially integrate' the excluded (Adeel, 2015). Social exclusion occurs when individuals are cut off from social life as a result of transportation and land-use systems issues. Generally, limited access to facilities and opportunities results from a lack of accessibility between residences and locations of facilities (Church et al., 2000).

From labor market exclusion to encompassing social, political, and cultural dimensions, the theoretical understanding of social exclusion evolution reflects a growing recognition of its impact on individuals' overall quality of life and participation in society. The breadth of social exclusion, affecting job, housing, education, and healthcare, underscores its significance for researchers and policymakers. This context highlights the emergency to address the varied factors contributing to exclusion, including ethnicity, gender, poverty, disability, and age, to foster social cohesion and improve individual well-being (Levitas et al., 2007).

The scope of social exclusion is broad, impacting various domains of life such as employment, housing, education, and healthcare and many aspects of daily life. Social exclusion can result from a combination of multiple factors including ethnicity, gender, poverty, disability, and age, making it a critical issue for policymakers and social researchers alike (Levitas et al., 2007). According to Hai and Quang (2022), there are just as many concepts of social exclusion as there are scholars on the problem.

2.1.2. Core theories and affected populations

Social exclusion not only has an impact on individual quality of life, it also undermines the fairness and unity of society as a whole (Levitas et al., 2007). Turdalieva and Edling (2017) identified social exclusion as a misunderstanding-prone concept due to its practical importance in policymaking. Social exclusion must be distinguished from related notions, leading to the necessity to explore the theoretical frameworks that underpin the study of social exclusion and identify the populations most affected by it. A thorough examination of social exclusion theories and affected populations is crucial to understand the complexities of social exclusion in the context of transportation:

- **The Structuralist Theory:** Structuralist perspectives on social exclusion focus on the societal structures and economic systems that contribute to inequality and exclusion. According to this theory, social exclusion is a result of institutionalized inequalities within the labor market, education system, and other societal institutions (Byrne, 1999). Structuralist approaches emphasize the role of policy and structural changes in addressing social exclusion.
- **The Agency-Oriented Theory:** In contrast to structuralist theories, agency-oriented theories emphasize the role of individual actions and decisions in contributing to social exclusion. This perspective highlights how personal choices, behaviors, and social networks can influence an individual's risk of exclusion (Giddens, 1991). Agency-oriented approaches suggest that empowering individuals and enhancing their social capital can mitigate the effects of social exclusion.
- **The Cultural Theory:** Cultural theories of social exclusion focus on how cultural norms and practices can contribute to the marginalization of certain groups in the society. This perspective examines how cultural distinctions, such as language, religion, and customs, can create barriers to social integration and access to resources (Lamont and Small, 2008). Cultural approaches advocate for the recognition and inclusion of diverse cultural identities as a means to combat social exclusion.
- **The Intersectionality Theory:** Intersectionality provides a framework for understanding how various forms of identity (e.g., race, gender, class, disability) interact to create unique experiences of exclusion (Crenshaw, 1991). This theory argues that social exclusion cannot be fully understood without considering the multifaceted and overlapping identities that affect individuals' experiences of marginalization.

Explore the affected populations also is necessary to provide a foundational understanding of the complexity of social exclusion:

- **Economically Disadvantaged :** Low-income individuals and families are disproportionately affected by social exclusion, as economic hardship limits their access to essential services, including transportation, healthcare, and education (Townsend, 1979).
- **Ethnic and Racial Minorities:** Racial and ethnic minorities often face systemic discrimination and segregation, contributing to their social and spatial exclusion. These

groups may experience limited access to public transportation, affecting their mobility and socioeconomic opportunities (Massey and Denton, 1993).

- **People with Disabilities** : Individuals with disabilities frequently encounter physical and social barriers that exclude them from fully participating in society, including inaccessible public transportation systems (Oliver, 1996).
- **Older Adults** : Older adults may face social exclusion due to mobility challenges, health issues, and societal ageism, impacting their access to transportation and participation in community life (Phillipson, 2013).
- **Gender and Sexual Minorities** : Women can experience social exclusion through discrimination and marginalization, affecting their access to transportation and safe public spaces (Browne and Lim, 2010).

Recognizing the theoretical underpinnings and identifying the populations most at risk of exclusion are crucial steps in addressing the challenges they face, particularly in the context of transportation.

2.1.3. Exploring the multidimensional nature of social exclusion

Social exclusion encompasses a complex array of factors beyond mere financial destitution, extending to barriers in education, transportation, employment, and housing, as well as challenges faced by specific demographic groups such as the elderly and ethnic minorities. A comprehensive approach to the multidimensional nature of social exclusion not only illuminates its varied dimensions but also emphasizes the importance of considering a wide array of factors - ranging from individual circumstances to broader societal structures - in understanding and addressing the challenges it poses.

Room (1995) highlights that approximately 10% of the French populace characterized by the impoverished, handicapped, and substance abusers are marginalized due to unemployment, ghettoization, and familial issues. This observation underscores poverty as a principal manifestation of social exclusion, a view that is expanded by noting the growing significance of non-poverty-related issues like job insecurity and eroding familial bonds in the discourse on social exclusion.

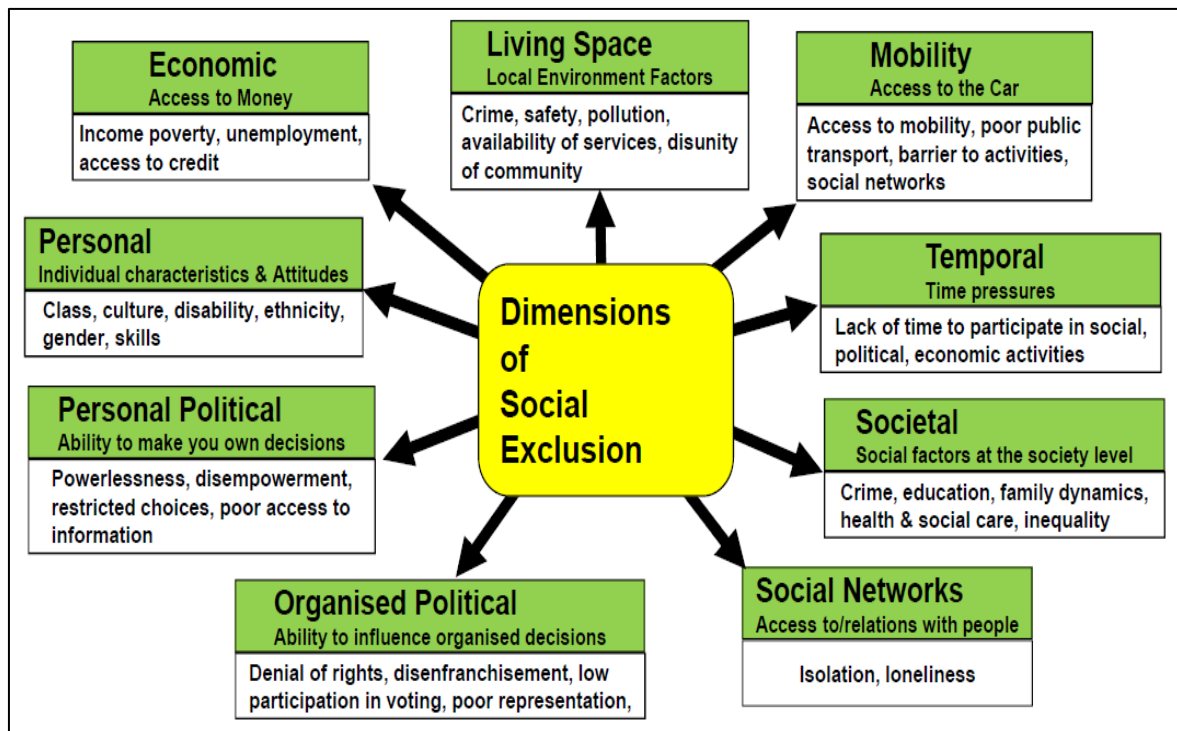


Figure 2.1. Understanding social exclusion and social inclusion

Further delineating the contours of social exclusion, Turdalieva and Edling (2017) articulate poverty as a deprivation of material goods and services, asserting that such deprivation signifies a noticeable, verifiable disadvantage. Contrary to conflating social isolation with poverty, Hine (2003) argues for a broader understanding of social isolation, suggesting that it encapsulates more than the economic hardships faced by the impoverished. This perspective is echoed by Lamont et al. (2013), who assert that social exclusion should be seen as a process distinct from the consequences of poverty and material deprivation, emphasizing the role of inaccessible resources and physical barriers in fostering societal isolation.

Turdalieva and Edling (2017) further elaborate on the interconnected factors contributing to social exclusion, illustrating how low educational attainment adversely affects employment opportunities, thereby leading to reduced income, increased reliance on benefits, and a cascade of negative outcomes including diminished motivation, health issues, and a perpetuating cycle of educational and economic disenfranchisement.

The framework for analyzing social exclusion is proposed through eight categories encompassing labor and welfare markets, exclusion from economic networks and public

services, health, education, property markets, neighborhoods, and social networks. These categories serve as a basis for recent research, highlighting the multifaceted barriers to participation in societal activities. These barriers, as noted by Hine and Mitchell (2001b), are shaped by individual characteristics, life situations, neighborhood contexts, and the accessibility of social, political, and civic institutions within society.

2.1.4. Contrasting social exclusion with social inclusion

To illuminate the nuanced interplay and implications of social exclusion and social inclusion for societal dynamics and policymaking, an exploration into their contrast is indispensable. This study is necessary for developing narratives of practices, policies, and initiatives for promoting social inclusion, especially with regard to the transport domain – an essential facilitator of social and economic opportunities. Social exclusion can be defined as the process of marginalization of individuals or groups through the imposition of a range of barriers, which prevents them from participating in social life as well as in the distribution of resources and opportunities that are accessible to the rest of society. It encompasses the economic, social, cultural and even the political domains of life, which has worsened the plight of affected populations. Theories and evidence have provided an understanding of factors of social exclusion based on structural causes, individual behaviors, cultural practices, and the diverse identity of the subject, making it multi-faceted.

Conversely, social inclusion seeks to ameliorate participation conditions for individuals and groups across society's fabric. Its goal is to empower all members to actively engage in economic, social, cultural, and political realms, thereby fostering equity, opportunity, and dignity irrespective of background or circumstances. The ambit of social inclusion is wide, targeting the dismantlement of participation barriers and ensuring equitable access to services and opportunities, including but not limited to transportation, education, healthcare, and employment (World Bank, 2013). While social exclusion is characterized by institutionalized barriers, discrimination, and systemic inequalities disenfranchising specific populations, social inclusion efforts aim to eradicate these obstacles, fostering environments conducive to equality. Policy interventions, legislative reforms, and community initiatives are instrumental in promoting equal participation opportunities for all (Sen, 2000).

The repercussions of social exclusion are profound, leading to disparities in health, education, employment, and service access, thereby perpetuating poverty and marginalization cycles. In contrast, social inclusion outcomes manifest in bolstered social cohesion, diminished inequalities, and enhanced quality of life for previously marginalized individuals and communities (Levitas et al., 2007).

Inclusion encompasses more than service access improvement; it involves enabling the disadvantaged to overcome transport network engagement barriers, highlighting its developmental significance. Inclusion entails guaranteeing full participation opportunities for everyone, emphasizing the importance of recognizing and addressing exclusion root causes, promoting involvement in decision-making processes, and implementing effective, sustainable solutions. The concept of social inclusion/exclusion is further enriched by positing that not all inclusion is beneficial, and that exclusion can sometimes have positive dimensions. This perspective introduces the complexity of social integration and solidarity, emphasizing the broader societal implications of exclusion and the untapped potential of excluded groups.

Adeel (2015) synthesizes the discourse, identifying six universal social exclusion characteristics, ranging from its integrative objective and multidimensional scope to its process and outcome duality, the spectrum of deprivation, relativity, and inherent subjectivity. This comprehensive view facilitates a deeper understanding of social exclusion/inclusion, guiding targeted, context-sensitive interventions.

2.2. Transport and Social Exclusion Dynamics

Transportation plays a critical role in both social exclusion and inclusion. Limited access to reliable and affordable transportation exacerbates social exclusion by hindering access to essential services, employment opportunities, and social networks (Lucas, 2012). On the other hand, inclusive transportation systems can facilitate social inclusion by ensuring mobility and access for all community members, particularly those who are most vulnerable to exclusion, such as low-income individuals, ethnic and racial minorities, people with disabilities, older adults, and gender and sexual minorities.

To move towards social inclusion, it is crucial to adopt an integrated approach that addresses the underlying causes of social exclusion and actively promotes inclusivity in all aspects of society, including transportation. This requires collaboration between policymakers, community organizations, and citizens to create inclusive environments that support the full participation of all members of society.

2.2.1. Evolutionary perspectives

Understanding the historical evolution of transport and social exclusion dynamics is crucial for addressing current challenges and guiding future transport policy. The relationship between transport and social exclusion has evolved alongside societal changes, reflecting broader economic, social, and technological developments, emphasizing the pivotal moments that have shaped the current evolution of the transport and social exclusion relationship. This perspective highlights the importance of considering the social dimensions of transportation and the need for policies that promote inclusivity and accessibility, particularly for marginalized populations.

- **Pre-Industrial Era:** In pre-industrial societies, the concept of social exclusion in transportation was virtually non-existent due to the limited need for travel and the localized nature of communities. Mobility was restricted by physical capacity and the availability of rudimentary transport means, such as horse-drawn carriages, which were accessible only to the affluent segments of society (Law, 1999). During this period, social exclusion was more directly tied to land ownership and access to resources rather than transportation.
- **Industrial Revolution :** The Industrial Revolution marked a significant turning point, as mass migration to urban areas increased the importance of transportation for accessing jobs and resources. The development of railroads and public transit systems transformed urban mobility but also introduced new forms of social exclusion. Working-class populations often lived in areas with poor transport access, exacerbating economic and social divides (Newman and Kenworthy, 1999).
- **Post-War Period :** The post-war era saw unprecedented economic growth and the rise of the private automobile, which reshaped urban landscapes and transport priorities. While cars symbolized freedom and social status for many, they also led to the marginalization of those unable to afford them. The focus on car-centric infrastructure resulted in the

neglect of public transportation systems, further disadvantaging those reliant on them (Dupuis and Thorns, 1998).

- **Late 20th Century to Present:** The late 20th century witnessed growing recognition of the environmental and social drawbacks of car-centric policies, sparking interest in sustainable transportation and the social aspects of mobility. Scholars like Lucas (2012) and Church et al. (2000) have emphasized the role of transport in facilitating or hindering social inclusion, leading to an increased focus on the needs of vulnerable populations in transport planning.

2.2.2. The realities and underlying causes

Transportation plays a critical role in shaping opportunities for social and economic participation. However, barriers to accessing transportation services significantly contribute to social exclusion within urban contexts. The multifaceted nature of social exclusion in transportation highlights the interplay between physical, economic, and social barriers that restrict access for various population groups.

The underlying causes of TRSE are rooted in broader systemic and structural issues. Socioeconomic inequalities, urban planning, and policy decisions favoring car ownership, discrimination and social biases, and technological and information barriers collectively contribute to the exclusion of specific groups from transportation systems (Kenyon et al., 2002; Lucas, 2004; Preston and Rajé, 2007; Martens, 2016).

According Li et al. (2020), social exclusion in transportation is the denial of necessary transportation means for full societal participation. The exclusion manifests in different forms, ranging from inaccessible transport options for disabled individuals to prohibitive costs for low-income populations and inadequate services in marginalized areas (Mohaimenuzzaman et al., 2016). They point out that the negative repercussions of increased automobile use, such as social, environmental, safety, and health impacts, disproportionately affect low-income communities.

Similarly, Yigitcanlar et al. (2018) emphasize that barriers to public transportation usage exacerbate accessibility issues, citing factors such as limited off-peak services, poor facilities and convenience at junctions, and the prohibitive costs of public transportation. The urban

environment often seems designed for a narrow demographic, alienating non-drivers and creating hazardous conditions for pedestrians.

According to Lucas (2012), several disadvantaged groups are particularly affected by transportation exclusion, including those with physical impairments, low-income individuals, and residents of areas dependent on vehicle access. Di Ciommo & Shiftan (2017) argue that incorporating equity considerations in transportation planning enhances system accessibility for all, emphasizing the importance of considering social and geographical factors in evaluating social well-being.

Luz and Portugal (2022) and Lira (2017)) highlight specific challenges faced by elderly, disabled, and illiterate individuals, such as difficulties in navigating transportation infrastructure, overcrowded vehicles, and inadequate pedestrian facilities. McCray and Brais (2007) highlight additional burdens faced by women, who often juggle multiple roles and responsibilities, affecting their transportation access.

Church et al. (2000) articulate that transportation system deficiencies hinder participation in essential societal functions like education, employment, and healthcare. Di Ciommo and Shiftan (2017) critique the prevalent utilitarian focus in transportation system evaluations, which overlooks the needs of subpopulations unable to afford services or facing mobility challenges.

Adeel (2015) underscores the vulnerability of poor and socially disadvantaged households to transportation disadvantages, advocating for a social exclusion approach in transportation policy and planning (Lucas, 2012). Sehatzadeh (2017) suggests that inclusive transport policies might offer cost-effective alternatives to economic interventions for improving mobility among disabled populations.

A comprehensive approach that includes policy interventions, inclusive urban planning, and targeted investments in public transportation infrastructure and services is required to address these causes. Such measures are critical for developing transportation systems that cater to the needs of all community members, promoting social inclusion, and mitigating the impacts of TRSE.

2.2.3. Exclusion of vulnerable groups from public transportation

Marginalization within public transportation is a multifaceted issue, impacting accessibility, service quality, and the overall inclusivity of urban mobility networks.

Individuals with disabilities face significant barriers in transportation, hindering their participation in society and access to healthcare. Mobility challenges are prevalent among the elderly, compounded by cognitive impairments, and sensory disabilities, leading to unequal access to high-quality healthcare, especially in resource-constrained settings (Choi et al., 2019; Okoro et al., 2018). These barriers are exacerbated by economic hardships related to vehicle ownership, with up to 67% of low-income families in the UK experiencing financial strain from transportation costs (Yuan et al., 2022). Marginalized groups often bear the brunt of inefficiencies and inequities in public transportation systems, including but not limited to:

- **People with Disabilities** : Face challenges due to the lack of accessible infrastructure, such as elevators, ramps, and designated seating, as well as the absence of assistive services like audio-visual aids (Bromley, Matthews, and Thomas, 2007).
- **Low-Income Individuals and Families** : Affordability issues limit their mobility options, restricting access to essential services and opportunities. This group is disproportionately affected by fare increases and service cuts (Lucas, 2012).
- **Ethnic and Racial Minorities** : May experience both direct and indirect discrimination in public transportation systems, ranging from racial profiling to service disparities in minority neighborhoods (Grengs, 2010).
- **Older Adults** : Often encounter barriers related to mobility, safety, and comfort, making public transportation use challenging and sometimes hazardous (Rosenbloom, 2007).
- **Rural and Peri-Urban Residents** : The scarcity or complete absence of public transportation services in rural and peri-urban areas leaves residents isolated and unable to access urban centers efficiently (Farrington and Farrington, 2005).

The economic burden of vehicle ownership is profound, with a notable percentage of UK households facing economic hardship due to the high costs associated with maintaining a car, disproportionately affecting the lowest income quintiles and marginalized groups, including elderly, disabled individuals, and ethnic minorities (Yuan et al., 2022). Despite the

decrease in gender disparities in automobile use, women, particularly in low-income households, remain less likely to be primary drivers.

Research highlights the strong correlation between transportation accessibility and social disadvantage, with low-income earners, the elderly, and ethnic minorities disproportionately affected by the spatial mismatch between residential areas and key urban centers. The legacy of apartheid in South Africa further exacerbates these disparities, emphasizing the need for targeted interventions to improve transportation accessibility for marginalized groups (Hine, 2008; Scheidegger, 2009). Several systemic issues contribute to the marginalization of specific groups within public transportation systems:

- **Inadequate Policy and Planning** : Urban and transportation planning that does not fully consider the needs of all community members can lead to services that are inaccessible or inadequate for marginalized groups (Martens, 2016).
- **Economic Constraints** : Limited funding and budgetary priorities often result in compromises that disproportionately affect services utilized by marginalized populations, such as cuts to less profitable bus routes or off-peak services (Currie, 2010).
- **Social and Cultural Barriers** : Stereotypes, stigma, and discrimination can influence the design and operation of public transportation systems, leading to environments that are unwelcoming or hostile to certain groups (Lucas, 2004).
- **Geographic Disparities** : The concentration of transportation services in urban centers neglects the needs of individuals living in less densely populated areas, who may rely heavily on public transport for access to employment, healthcare, and education (Farrington and Farrington, 2005).

Transportation barriers significantly impact access to healthcare services, with individuals with disabilities facing difficulties in reaching healthcare facilities due to inadequate public transportation options. The journey to healthcare facilities, characterized by long travel times and inconvenient modes of transport, often deters access to higher-quality services (Ho et al., 2007). Enhanced public transportation infrastructure and services, including disability-friendly features and optimized travel routes, are essential for improving healthcare accessibility (Yuan et al., 2022).

Addressing these challenges requires comprehensive policy interventions aimed at enhancing transportation infrastructure and accessibility. Implementing measures such as fast lanes during peak hours and equipping public transportation with disability-friendly features can significantly alleviate these barriers, contributing to a more inclusive and accessible transportation system (Yuan et al., 2022). To mitigate the marginalization experienced by vulnerable groups in public transportation systems, several strategies can be employed:

- **Inclusive Planning and Design** : Engaging with marginalized communities in the planning process to ensure that their needs and preferences are adequately represented and addressed (Martens, 2016).
- **Affordability Programs**: Implementing fare reduction schemes, subsidies, and targeted discounts for low-income passengers to improve the affordability of public transport (Currie, 2010).
- **Enhanced Accessibility Features** : Investing in accessible infrastructure and services, such as low-floor buses, audible announcements, and visual aids, to accommodate individuals with disabilities (Bromley et al., 2007).
- **Anti-Discrimination Measures** : Enforcing policies to combat discrimination and promote a culture of respect and inclusivity within public transportation systems (Greengs, 2010).
- **Rural and Peri-Urban Service Expansion** : Extending services and creating new routes to improve coverage in underserved areas, thereby enhancing connectivity for rural and peri-urban residents (Farrington and Farrington, 2005).

2.3. The Role of Public Transportation in Fostering Social Inclusion

Public transportation systems play a pivotal role in urban and regional development, significantly impacting social equity and inclusion. By providing universal access to mobility, public transportation can catalyze equality, breaking down barriers that prevent individuals from fully participating in society.

2.3.1. Public transportation as a social equalizer or catalyst for equality

Public transportation has the power to be a major social equalizer since the transportation system focuses on accessibility and affordability. As defined by Kenyon et al. (2002),

“transport exclusion” occurs when people are unable to engage in society due to limited opportunities and services access, and social networking is an effect of a lack of mobility in an environment and society that assumes higher levels of mobility. Socially excluded people face difficulties such as immobility, unavailability, inaccessibility of transport, safety, and security services related to transport. Inadequate access to employment centers, business hubs, and medical services for low-income individuals, seniors, and single-parent families reflects the hardships of social marginalization (Paez et al., 2009).

The primary challenge lies in establishing new networks that can offer adequate connectivity for individuals with low incomes, connecting their residential areas to essential destinations such as workplaces, schools, colleges, medical centers, day-care facilities, and shopping centers. It is important to acknowledge these challenges as they extend beyond the scope of transport policy and require comprehensive solutions. An existing study suggested ways to improve accessibility planning such as reviewing the regulations, improving education, reducing crimes associated with transport, and integrating transport planning, etc. A study also found that rural youth are more concerned about exclusion disparity as compared to urban youth due to a shortage of facilities for education, health, and transport (Cartmel and Furlong, 2000).

Diversifying the range of activities within an area presents an opportunity to reduce the necessity for individuals to seek job opportunities and services outside the central business district (CBD), thereby impacting travel distances, travel times, and the viability of transportation alternative modes such as walking, public transport, or cycling (Ma et al., 2018). Areas with greater diversity enable individuals to access activities by walking, which can alleviate the need for private car ownership and associated expenses (Van Wee and Geurs, 2011). An urban policy oriented towards sustainable transport is also a must. It may typically invest in public and bicycle infrastructure and mobility as a service (MaaS), smart and shared mobility, and integrated ticket and ride-sharing facilities (De Vrij and Vanoutrive, 2022).

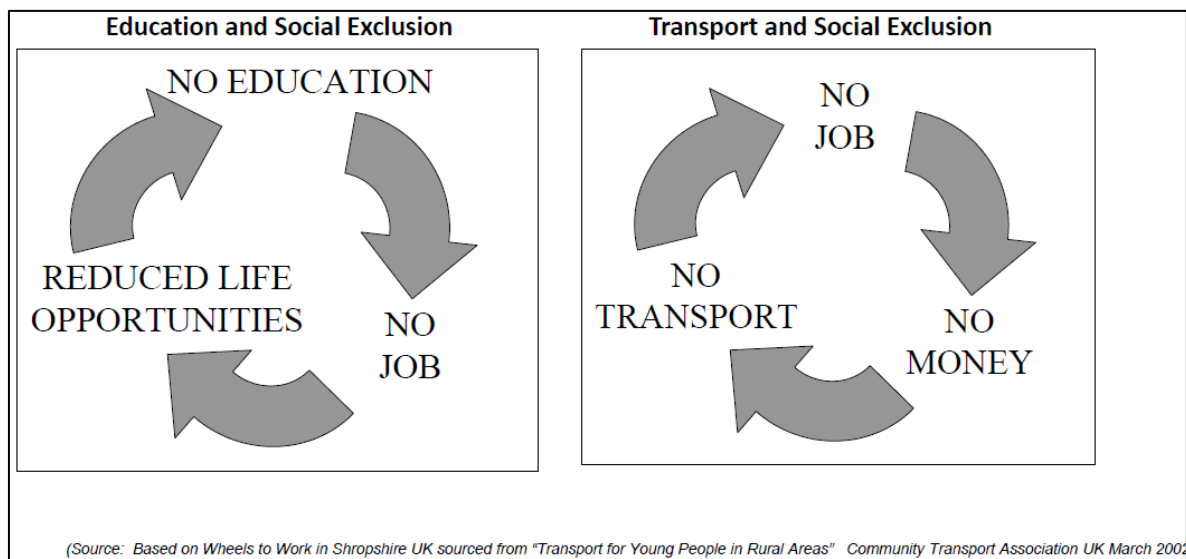


Figure 2.2. Interrelation between transportation and opportunities

Public transportation has the potential to level the playing field for all members of society to access employment, education, healthcare, and social activities by offering affordable, accessible, and reliable mobility solutions. This democratization of mobility is essential for building more equitable communities where opportunities are not limited by mobility constraints:

- **Universal Design and Accessibility :** Implementing universal design principles in public transportation ensures that services are accessible to everyone, including those with disabilities, older adults, and families with young children. Features such as low-floor buses, ramps, tactile paving, and auditory signals are essential for accommodating diverse user needs (European Commission, 2013). Investments in accessible infrastructure, such as low-floor buses, ramps, and audible signals, are vital for ensuring that everyone can use public transit services.
- **Affordable Transportation for All :** Public transit provides a cost-effective mobility option, especially important for low-income households that cannot afford the expenses associated with private vehicle ownership. Affordable public transportation enables these individuals to access essential services and opportunities, contributing to social and economic mobility (Lucas, 2012).
- **Equitable Urban Development:** Efficient and widespread public transportation networks can bridge the gap between disadvantaged neighborhoods and economic centers, promoting spatial equity. This connectivity ensures that residents of underserved areas

have equal opportunities to participate in the economic, social, and cultural life of the city (Martens, 2016). Exclusion from essential facilities can arise when there is a lack of availability or significant distance between vital opportunities, such as healthcare, employment, schools, leisure, or shopping services, and an individual residence location (Luz and Portugal, 2022). Furthermore, even if these opportunities are accessible by public transportation, they may not be suitable for people's needs.

- **Economic Opportunities:** Access to reliable public transportation expands employment opportunities for marginalized groups by enabling them to reach a broader range of job locations. This mobility is crucial for reducing unemployment and underemployment rates among vulnerable populations (Cervero, Sandoval, and Landis, 2002).
- **Educational Access:** Public transit facilitates access to educational institutions, playing a critical role in lifelong learning and skill development. For students from low-income families, public transportation may be the only viable option for reaching schools and universities, thereby playing a direct role in social mobility (Bull, 2007).
- **Healthcare Accessibility:** The availability of public transportation is linked to better healthcare outcomes, as it ensures that individuals can access medical services, attend appointments, and obtain necessary medications. This is particularly vital for older adults, individuals with disabilities, and those without access to private vehicles (Syed, Gerber, and Sharp, 2013).
- **Social and Community Engagement:** Public transportation enables individuals to engage in social and cultural activities, fostering a sense of community and belonging. By removing mobility barriers, public transit encourages participation in community events, recreational activities, and social networks, enhancing social cohesion (Currie, 2010).

Public transportation emerges as a powerful tool for fostering social inclusion and equality. By ensuring accessibility, affordability, and connectivity, public transit systems can significantly reduce social exclusion, enabling all community members to participate fully in societal activities and access essential services.

2.3.2. Socioeconomic participation and transport accessibility

Transport accessibility plays a fundamental role in enabling socioeconomic participation, acting as a bridge that connects individuals to opportunities, services, and social networks. It can significantly influence the economic and social well-being of individuals and

communities. Transport accessibility is a key determinant of socioeconomic participation, impacting employment, education, health, and social engagement by (1) enhancing employment opportunities, (2) facilitating educational access, (3) promoting health equity, and (4) supporting social and cultural engagement:

- **Connectivity to Job Markets :** Access to public transportation expands the geographic range within which individuals can seek employment, thereby increasing their job opportunities. A study by Sanchez et al. (2003) found that access to reliable public transit is crucial for connecting individuals, especially those from low-income households, to job markets.
- **Impact on Employment Rates :** Kawabata and Shen (2006) demonstrated that improved transit accessibility is positively associated with higher employment rates among disadvantaged populations. Their research highlights the importance of transit services in facilitating the participation of these groups in the labor markets.
- **Access to Educational Institutions :** Public transportation enables students from various socioeconomic backgrounds to access educational institutions, which is vital for enhancing educational outcomes and reducing disparities. A report by the American Public Transportation Association (2017) emphasized the role of transit in ensuring students and educators can reach schools and universities, supporting educational attainment and lifelong learning opportunities.
- **Influence on Educational Participation :** McDonald (2008) explored how transportation affects students' decisions regarding educational participation, finding that improved access to public transit increases the likelihood of continued education, particularly among students from lower-income families.
- **Healthcare Access :** Reliable public transportation systems ensure that individuals can access healthcare facilities and services, which is essential for promoting public health and reducing healthcare disparities. Syed, Gerber, and Sharp (2013) highlighted how transportation barriers can negatively impact healthcare access, emphasizing the need for accessible transit options to support health equity.
- **Social Determinants of Health :** The accessibility of transportation also addresses social determinants of health by reducing isolation and facilitating access to social services, healthy food options, and recreational activities, which contribute to overall well-being (Litman, 2013).

- **Participation in Social and Cultural Activities** : Public transit provides the means for individuals to engage in social and cultural activities, fostering a sense of community and belonging. Currie's (2010) work illustrates how transportation accessibility can enhance social inclusion by enabling participation in community events, visiting friends and family, and accessing cultural venues.
- **Reducing Social Isolation** : Enhanced transit accessibility is particularly important for vulnerable populations, such as the elderly and individuals with disabilities, helping to reduce social isolation and improve quality of life (Rosenbloom, 2007).

2.4. TRSE: Conceptualization and Dimensions

TRSE represents a critical area of study within urban and transportation planning, emphasizing the interconnection between transportation systems and social equity. The majority of studies on TRSE focus on measuring, conceptualizing, and identifying the exclusion from transport in practice. Several studies have conceptualized and defined TRSE (Kenyon et al., 2002; Church et al., 2000; Preston and Rajé, 2007; Van Wee and Geurs, 2011; Pritchard et al., 2014), but they usually provide a definition of social exclusion followed by a link to mobility. Only a few studies have described exclusion problems clearly in the context of transport.

As a result, measuring TRSE is limited by the conceptualization challenge (Chen, 2016). Land-use and transport policies have been taking into account TRSE when they are being developed and evaluated since the 1990s and early 2000s. The UK has become increasingly interested in studying TRSE to promote sustainable transportation.

2.4.1. Concept and theoretical development of TRSE

A highly cited conceptualization of TRSE is offered by Kenyon (2003), as follows: *“The process by which people are prevented from participating in the economic, political, and social life of the community because of reduced accessibility to opportunities, services, and social networks, due in whole or part to insufficient mobility in a society and environment built around the assumption of high mobility”* (Kenyon, 2003).

The evolution of TRSE reflects broader societal changes, with current perspectives emphasizing the need for inclusive, sustainable transport systems that recognize the diverse needs of all community members. This includes not just physical accessibility, but also affordability, safety, and the integration of transport systems with urban planning to ensure equitable access to opportunities and resources. In their recent paper, Yigitcanlar et al. (2018) searched for the origin of the word through the Web of Science and Academic Search. Relevant literature has been picked using search algorithms on citations of 1950-2016 works that include "transport disadvantages", "social exclusion", and "TRSE" inside the title, description, or keywords. An original search yielded 1792 works. After relevancy checks and filtering, 336 publications remained. Yigitcanlar et al. (2018) studied each publication's abstract, introduction, and conclusion to see if they may be suitable for the final review. They analyzed the theoretical concepts, best regulations and processes, gaps, and issues linked with travel social exclusion. Their article evaluates the items of literature and policy papers evaluated for the final selection. Due to the ambiguity inherent in both terms, the article seeks to define social exclusion before describing it in transportation.

Social exclusion may be considered as a more general term, but TRSE is defined as the inability of individuals to take part in the community's social, economic, and political life as a result of limited access to services, opportunities, and social networks caused by insufficient mobility. There is limited mobility in a society and environment developed on the assumption of higher mobility (Kenyon, Lyons, and Rafferty, 2003).

The concept of TRSE is grounded in the broader framework of social exclusion, adapted to specifically address how transportation systems can contribute to or mitigate exclusionary processes. Its theoretical basis combines elements from social equity theory, spatial mismatch hypothesis, and accessibility planning.

Social equity theory focuses on fairness and justice in public policy and serves as a foundational pillar for understanding TRSE. This perspective emphasizes the importance of equitable access to transportation as a means of ensuring that all individuals, particularly those from marginalized communities, have the opportunity to participate fully in society (Martens, 2012). It argues for transportation planning and policies that prioritize the needs of the most vulnerable populations.

The spatial mismatch hypothesis was introduced by John Kain in the 1960s, highlighting the disconnection between the locations of low-income populations and employment opportunities, often exacerbated by inadequate public transportation options (Kain, 1968). This theory underlines a key dimension of TRSE, where the physical distance and lack of accessible transit options hinder economic and social participation.

Accessibility planning focuses on the extent to which urban systems, including transportation, enable all individuals to reach desired services and activities. The concept of accessibility is central to TRSE, as it directly relates to the ability of people to use transportation systems to access essential services, employment, education, and other activities critical for full participation in society (Van Wee and Geurs, 2011). This approach advocates for transportation systems designed to meet the diverse needs of the population, thereby reducing exclusion.

Earlier debates about social exclusion and transport planning failed to consider the impact of transportation on the level of exclusion of people, according to Adeel (2015). According to him, transportation planning was "exclusionary" because it focused on certain trips (such as commuting journeys), specific locations (such as city centers), and specific transportation issues (such as congestion) while neglecting many key journeys (recreational trips), areas (suburban zones), and transportation issues (public transportation). According to Lucas (2004a), social concerns in transportation are viewed as secondary or tertiary. Hine and Mitchell (2001a) discovered that the relationship between social exclusion and transport was poorly understood and that the literature on the subject remained few and poor, making it difficult to advise decision-makers on the development of socially responsive transportation.

2.4.2. Exploring the multidimensional nature of TRSE

TRSE is inherently multidimensional, reflecting the various ways through which individuals can be marginalized within transportation systems. TRSE manifests in several interrelated ways, significantly impacting individuals' ability to participate fully in society:

- **Physical Accessibility** : Physical accessibility concerns the design and infrastructure of transportation systems and their usability by all individuals, including those with physical disabilities. Many transportation systems are not designed with all community members

in mind, leading to difficulties for people with disabilities, older adults, and those with young children (Kenyon, Lyons, and Rafferty, 2002). Inaccessible transport infrastructure, such as the lack of elevators or ramps in public transit stations, exemplifies physical barriers that contribute to social exclusion. Challenges in physical accessibility can range from the absence of ramps and elevators in public transit stations to the lack of safe pedestrian paths. Imrie (2000) discusses the significance of inclusive design in public transportation, arguing for the necessity of considering diverse physical needs in urban planning to ensure equitable access for all users, including the elderly and those with disabilities.

- **Geographical Accessibility :** Geographical accessibility highlights the spatial distribution of transportation services and how it affects access to essential services and opportunities. Lucas (2004) examines the spatial mismatch between where low-income populations live and where job opportunities are located, emphasizing that inadequate public transit options exacerbate this mismatch, limiting economic and social opportunities for marginalized groups. Enhancing geographical accessibility requires a strategic expansion of transit services to underserved areas, ensuring more equitable urban mobility. Individuals living in rural or remote areas often face significant challenges in accessing reliable public transportation, which is frequently concentrated in urban centers. This geographic isolation limits access to employment, education, healthcare, and other essential services (Farrington and Farrington, 2005).
- **Economic Accessibility :** Economic accessibility focuses on the affordability of transportation options, which can be a significant barrier for low-income households. The cost of public transit fares, along with the expenses associated with private vehicle ownership, can restrict mobility options for economically disadvantaged individuals. Currie and Delbosc (2011) highlight the importance of implementing fare reduction schemes and subsidies to improve economic accessibility, thereby enabling greater participation in societal activities. The cost of transportation can be prohibitively expensive for low-income individuals, making it difficult for them to afford public transit fares or the costs associated with owning and maintaining a private vehicle (Currie and Delbosc, 2011).
- **Temporal Accessibility :** Temporal accessibility refers to the availability of transportation services at different times, particularly outside standard working hours. This dimension is crucial for individuals with non-traditional work schedules, such as shift workers, or those with caregiving responsibilities. Hine and Mitchell (2001) discuss how limited

service hours can exclude certain populations from accessing employment and other activities, stressing the need for public transit systems to offer flexible and frequent services to accommodate diverse schedules. Service frequency and operational hours of public transportation can exclude shift workers, those with non-traditional work hours, and individuals who require flexibility, such as parents with childcare responsibilities (Lucas, 2012).

- **Informational Accessibility :** Informational accessibility deals with the availability and comprehensibility of information about transportation services, which is essential for planning travel. Language barriers, digital divides, and the clarity of provided information can all impact an individual's ability to utilize public transportation effectively. Gossling (2016) explores how advancements in technology can improve informational accessibility but also warns of the potential for digital exclusion among those without access to smartphones or the internet.
- **Social and Psychological Dimensions :** Beyond the physical and operational aspects of TRSE, social and psychological dimensions also play a significant role. These include feelings of safety and security within the transportation environment and the social stigma associated with using certain types of transport. These aspects can deter individuals from utilizing available services, further contributing to social exclusion (Kenyon, Lyons, and Rafferty, 2002).

2.4.3. Dimensions of TRSE

TRSE occurs when a particular group of people is excluded from a safe, efficient, effective, and integrated transportation system. According to Church et al. (2000), transportation was rarely considered a central issue in social exclusion until 2000, as it is defined as the restriction of access to opportunities to engage in the community's social and political life, resulting in a worse quality of life (Kenyon et al., 2002).

By defining TRSE into several categories, Church et al. (2000) fill in this gap. As part of their conceptual framework, Church et al. (2000) group TRSE into physical, geographical, and facility exclusions, economic (affordability) exclusions, time-based (temporal) exclusions, fear-based exclusions, and spatial/space exclusions. To assess the efficacy of transportation strategies and initiatives designed to address social exclusion, this framework guides the review of transport exclusion indicators. As a result of the 1999 UK Index of

Local Deprivation and Mersey travel indicators of social sustainability, the authors conclude that TRSE can be partially attributed to accessibility issues between the locations of socially excluded people and opportunities (Chen, 2016).

Three processes are identified by Church et al. (2000) as probable causes of TRSE: (1) the time and space organization within households, (2) the transportation system structure, and (3) the facilities and opportunities organization that individuals want to access in time and space.

Furthermore, they proposed seven dimensions of a conceptual framework:

- “Physical exclusion: Because of the physical structure of the transportation system, persons with disabilities may face physical and psychological obstacles
- Geographic exclusion: Geographically distant sites may limit the capacity to conduct activities in the surrounding neighborhood;
- Exclusion from facilities: Residents in neighborhoods with high levels of social exclusion frequently lack access to good shops, financial, recreation, health, and educational services due to time and income constraints, as well as the distance of some of these services from problems areas;
- Economic exclusion: Travelling at a high financial or temporal cost might restrict or prevent access to opportunities or jobs, and hence revenue;
- Time-based exclusion: Other time demands, such as combining job, family, and child-care responsibilities, diminish the time available for travel, an issue known as time poverty;
- Fear-based exclusion: Where fear of criminality limits the utilization of public areas and/or transportation services;
- Space exclusion: Where safety and space management processes may discourage marginalized groups, particularly young people, from accessing public transportation” (Sehatzadeh, 2017).

Studies of transportation and social exclusion have repeatedly utilized this framework, as well as the development of measures and indicators of transportation disadvantages or accessibility (Church, Frost, and Sullivan, 2000; Sehatzadeh, 2017). As a result of the interrelationship of these variables at a particular point in time, depending on location, many

opportunities are available to access. TRSE, then, encompasses several dimensions, reflecting the multifaceted ways in which transportation systems can either facilitate or hinder social inclusion:

- **Physical Accessibility** : Concerns about the physical design of transportation systems and their usability by all individuals, including those with disabilities.
- **Geographical Accessibility** : Relates to the distribution of transportation services across space, highlighting disparities between urban and rural areas, as well as between different urban neighborhoods.
- **Economic Accessibility** : Involves the affordability of transportation options, which can be a barrier for low-income households.
- **Temporal Accessibility** : Refers to the availability of transportation services at different times of the day and week, affecting those with non-standard work schedules or caregiving responsibilities.
- **Informational Accessibility** : Deals with the availability and understandability of information about transportation services, crucial for people who may face language barriers or lack internet access.

The spatial dimension aligns with the geographic and space-related aspects identified by (Church et al., 2000), while the psychological dimension connects to exclusion based on fear. Cass et al. (2005) established four access dimensions associated with social exclusion: Physical, Economic, Organizational, and Temporal. The first three dimensions in the framework bear similarities to those presented by (Church et al., 2000). The fourth dimension, organizational, pertains to the usability of different transportation modes, considering factors such as convenient and suitable scheduling, frequency, network structure, punctuality, dependability, and quality of the experience. Yigitcanlar et al., (2019) analyzed six dimensions, five of which are equivalent to those given by previous authors, with the addition of an informational dimension focusing on the information's availability on public transportation usage. Lastly, Caulfield and Benevenuto (2019) put forward eight social exclusion dimensions, incorporating the seven dimensions previously suggested by (Church et al., 2000) and adding social position-based exclusion.

Social position-based exclusion involves limitations on public movement due to social restrictions based on factors like gender, age, race, ethnicity, nationality, religion, or caste,

with migrants and young people often experiencing such barriers (Farrington, 2007; Stanley et al., 2011; Yigitcanlar et al., 2019). Poor pedestrian infrastructure poses accessibility limitations for the elderly and physically disabled, increasing the risk of falls and stumbles (Ma et al., 2018). Dependence on third parties restricts the freedom of movement for disabled and older individuals (Currie et al., 2010). Additionally, vulnerable populations such as the elderly, individuals with disabilities, and pregnant women face even more transport restrictions due to their specific physical conditions.

Time-based exclusion arises from factors such as infrequent transportation, lack of punctuality, and personal time constraints, limiting travel opportunities and restricting access to activities (Bocarejo and Oviedo, 2012). Excessive time spent on transportation may lead to time poverty, leaving little time for other essential activities (Farber and Pérez, 2011).

Geographic exclusion happens when individuals' place of residence hinders their access to transportation services or when the transportation network fails to connect them to destinations they desire to reach. Individuals living in areas located far from the cities' CBD with a single dominant center or distant from activity centers experience more accessibility disadvantages (Jaramillo et al., 2012; Vickers, 2017). However, barriers to mobility extend beyond geographic factors and encompass other transportation-related elements. Geographical barriers to accessing medical care may be influenced by available travel modes.

Cognitive and physical exclusion is considered when the built environment or transportation systems create barriers that hinder individuals with physical or cognitive limitations from accessing transportation and participating in activities. Numerous studies in the literature highlight the impact of physical and cognitive difficulties on individuals' capabilities (Kenyon et al., 2002; Wang, 2007; Stanley and Lucas, 2008; Lucas, 2010; Jaramillo et al., 2012; Goossens et al., 2020; Yuan et al., 2022). Fear-based exclusion encompasses concerns about safety, crime, and prejudices that deter people from certain places or modes of transportation (Cass et al., 2005; Lucas, 2010).

2.5. Measurement of TRSE

The measurement of TRSE is a complex undertaking, necessitating a multidimensional approach to accurately capture the various ways transportation systems impact social inclusion. Literature on the conceptualization and measurement of TRSE has grown rapidly over the past few decades (Lucas, 2002, 2012; SEU, 2003; Lyons, 2003; Lucas et al., 2007; Preston and Rajé, 2007; Van Wee and Geurs, 2011).

Progress in studies on social exclusion and transportation has yet to convert into shared actions among local planning agencies due to inadequate articulation and a lack of evaluation instruments at various levels of administration (Lucas, 2012). According to Lucas (2012), there is widespread consensus that metric-based measurements are required to determine acceptable standards and levels of public transportation for social inclusion. (Sehatzadeh, 2017).

2.5.1. The complexity of TRSE measurement conceptualization

Measuring TRSE presents several conceptual challenges, stemming from its multidimensional nature, the subjectivity of experiences, data limitations, and the dynamic and context-specific aspects of social exclusion. Overcoming these challenges requires methodological flexibility, innovative data collection techniques, and an inclusive approach that considers the diverse experiences of all transportation system users.

Multidimensionality is one of the main conceptual challenges associated with TRSE measurement. The primary challenge in measuring TRSE is its inherently multidimensional nature, as outlined in section 2.4.2. TRSE encompasses physical, geographical, economic, temporal, informational, and social-psychological dimensions, each requiring distinct measurement approaches. Cass et al. (2005) discuss the complexity of capturing the broad spectrum of factors that contribute to TRSE, highlighting the need for comprehensive frameworks that can accommodate the multifaceted aspects of TRSE.

Mobility and accessibility appear to be two of the most important dimensions of TRSE in many papers. In their study on transport exclusion, Al-Rashid et al. (2020) examined four approaches: accessibility, mobility, equity, and poverty. They compare three methods to

identify transport-excluded individuals, such as space-time prisms, deprivation indexes, and cumulative accessibility, based on the perception that TRSE serves as a barrier to job searching and healthcare access. A deprivation index is composed of six domains: geographic accessibility, employment, income, disability, housing, and education. Despite including an accessibility domain, the index is heavily influenced by socio-demographic characteristics without taking into account travel behavior and transport patterns. The cumulative accessibility is determined as the total number of opportunities located within the locations based on the largest distance traveled throughout the survey day. The main disadvantage of this approach is that it lacks consideration of individual space and time constraints. The inclusion of these constraints in accessibility calculations requires refined data and advanced computations.

Another significant challenge is the subjectivity and diversity of individual experiences with transportation systems. What constitutes exclusion for one person might not be the same for another, depending on a variety of factors including personal capabilities, preferences, and life circumstances. Stanley and Vella-Brodrick (2009) emphasize the importance of incorporating subjective measures of well-being and satisfaction in the assessment of TRSE, acknowledging that personal perceptions and experiences play a critical role in understanding the impact of transport on social exclusion.

The availability and quality of data pose another challenge in measuring TRSE. Comprehensive data on transportation use, accessibility, and affordability, particularly for marginalized populations, is often lacking or difficult to obtain. Lucas (2012) points out that the lack of detailed and disaggregated data can hinder the ability to accurately assess the extent of TRSE and identify the populations most at risk of exclusion.

TRSE is also dynamic and context-specific, varying across different geographical locations, cultures, and over time. The factors contributing to TRSE in a densely populated urban area may differ significantly from those in a rural setting. Additionally, changes in transportation policies, infrastructure, and services can alter the landscape of TRSE. Preston and Rajé (2007) highlight the importance of context in evaluating TRSE, suggesting that measurement approaches must be adaptable to different settings and sensitive to changes over time.

Addressing these challenges requires also integrating both objective and subjective measures to provide a holistic view of TRSE. Objective measures might include spatial analyses of service coverage, affordability indices, and accessibility modeling, while subjective measures could involve surveys and interviews to capture personal experiences and perceptions of transportation systems. Church et al., (2000) advocate for a mixed-methods approach that combines quantitative and qualitative data, enabling a more nuanced understanding of TRSE and its impacts on individuals and communities.

2.5.2. Absence of consensus for TRSE measurement framework

Kamruzzaman et al. (2016) state that social exclusion cannot be defined or quantified with a high level of consensus. The lack of measurement of transport disadvantage for social exclusion results in a near-total absence of a practical and theoretically valid measure. The social exclusion concept is therefore difficult to assess and measure accurately.

Addressing the complexities of TRSE requires a coherent and comprehensive measurement framework that can capture its multidimensional nature. However, the diversity of TRSE manifestations and the varying contexts in which it occurs pose significant challenges to developing a one-size-fits-all approach.

The primary challenge in creating a unified framework for TRSE measurement lies in the multidimensionality and context-specific nature of the issue. TRSE is influenced by a wide array of factors, including but not limited to geographical, physical, economic, temporal, and social-psychological dimensions. Each of these dimensions may vary significantly across different geographical locations, cultures, and among various population groups, making it difficult to develop a universal set of indicators that are applicable in all contexts (Lucas, 2012).

Moreover, the dynamic nature of urban development and transportation systems requires that any measurement framework be flexible and adaptable over time. Changes in policy, infrastructure, technology, and societal norms can all impact the factors contributing to TRSE, necessitating periodic revisions to the measurement framework to remain relevant and effective (Preston and Rajé, 2007).

Despite these challenges, researchers have proposed several approaches to developing a more standardized framework for measuring TRSE:

- **Composite Indices** : Creating composite indices that combine multiple indicators of accessibility, affordability, and usability of transportation systems could offer a way to quantify TRSE. These indices would need to be adaptable to different contexts and sensitive to the specific conditions that contribute to exclusion in various environments (Stanley and Vella-Brodrick, 2009).
- **Geospatial Analysis** : Utilizing Geographic Information Systems (GIS) and other spatial analysis tools to map transportation networks, service areas, and population demographics can provide valuable insights into geographical and physical accessibility issues. This approach can help identify spatial mismatches between where people live and where key services and opportunities are located (Farrington and Farrington, 2005). There are several factors hampering access to vital resources, not the least of which is a lack of geographical coverage and transportation connections, as stated by Kamruzzaman et al. (2016). Lack of public transportation or insufficient connections between public transportation and opportunities in which people are interested or able to participate create accessibility disadvantages for people. Lack of transportation or connections severely restricts access to resources such as education, jobs, healthcare, and other services; significantly impacting the quality of life. Those with limited education or experience may face difficulties finding employment. There may not be enough hospitals in the area to meet their health needs. The time people spend getting to and from their destinations can limit their ability to participate in activities. Frequency of service, network architecture, transfer volume, processing velocity, and travel time may all affect service quality. As a result of time poverty, people do not have enough time to eat, sleep, and do other essentials. Furthermore, in terms of transportation risks, which is a key aspect in understanding the overall analysis of TRSE, research indicates that as road users, in poor neighborhoods individuals are more likely to experience injuries or fatalities (Kamruzzaman et al., 2016). This correlation can be attributed to the exposed environments and hazards typically linked with those neighborhoods in the UK. These areas are frequently located near major roads with significant levels of rapid-moving traffic. As a result, inhabitants in these areas are more vulnerable to road traffic risks such as road accidents, deaths, and pollution from traffic. This vulnerability is worsened by their dependency on walking for transit and the shortage of safe areas for young children.

- **Surveys and Qualitative Research :** Incorporating surveys, interviews, and participatory research methods can capture the subjective experiences and perceptions of individuals affected by TRSE. This qualitative data is crucial for understanding the social-psychological dimensions of exclusion and can complement the more quantitative measures obtained through indices and geospatial analysis (Church et al., 2000).

To better understand and measure social exclusion, some authors suggest a multi-dimensional approach. Research has traditionally identified marginalized groups and analyzed their exclusionary effects based on ad hoc methods. A danger of such an effort is the failure to adequately reflect the needs of disadvantaged people. Consequently, improving transportation policy will not ensure the long-term needs of people. During the assessment of both the extent to which requirements are being met and the extent to which they are being satisfied, Lucas (2012) stresses the importance of consulting those directly impacted.

- **Cross-disciplinary Collaboration:** Developing a unified measurement framework for TRSE requires collaboration across disciplines, including urban planning, transportation engineering, sociology, and public health. This interdisciplinary approach can ensure that the framework encompasses the wide range of factors contributing to TRSE and is capable of capturing its complex nature (Cass, Shove, and Urry, 2005).

According to Preston and Rajé (2007), transport exclusion can be measured using three factors: accessibility, mobility, and individual mobility. Rather than clarify the specific calculation of each of these measures, their paper focuses on conceptual discussions. For assessing the social sustainability of transport, Lucas et al. (2007) present five key indicators: accessibility, poverty, safety, housing, and quality of life (Chen, 2016). A review of the studies above indicates that transportation planners and geographers recommend mobility, accessibility, and activity space as the top measures for analyzing TRSE (Casas et al., 2009; Delmelle and Casas, 2012; Litman, 2002, 2013; Schönfelder and Axhausen, 2003).

The search for a unified measurement framework for TRSE is an ongoing process, reflecting the evolving understanding of social exclusion and the complexities of modern transportation systems. While a completely universal framework may be unattainable due to the diverse nature of TRSE, efforts to standardize measurement approaches can significantly improve the ability to assess, compare, and address TRSE across different contexts. These

efforts are critical for informing policy and planning interventions aimed at mitigating TRSE and promoting more inclusive and equitable transportation systems.

2.5.3. Accessibility as a measure for TRSE

Accessibility is increasingly recognized as a critical measure for understanding and addressing TRSE. It encompasses the extent to which individuals can reach desired goods, services, and activities, which is essential for full participation in society. Several studies use accessibility as a measure of TRSE (Casas et al., 2009; Bocarejo and Oviedo, 2012).

The concept of accessibility combines elements of spatial and social equity, highlighting the importance of both the physical availability of transportation services and the ability of individuals to use these services to meet their needs. Geurs and Van Wee (2004) define accessibility as the degree to which transport infrastructures facilitate individuals in reaching destinations within a reasonable time, effort, and cost. This definition emphasizes accessibility as a multidimensional construct, incorporating physical, economic, and temporal dimensions of access.

As Chen (2016) points out, accessibility has been discussed in existing studies as an indicator of TRSE. Litman (2011) suggests that when transportation is evaluated based on the ability of people to reach desired activities, non-driving behavior, and accessible land-use patterns should be considered as well as roads and parking facilities. In this way, the interests of both drivers and non-drivers will be taken into consideration.

Based on the conventional Hansen gravity equation, Bocarejo and Oviedo (2012) analyze transport exclusion by calculating three categories of accessibility (true accessibility, accessibility within standard parameters, and accessibility within wished preferences). Accessibility is calculated by calculating how many jobs residents can reach in different zones of a city. Accessibility may be estimated as 7% to 9% of the earnings of an individual based on international norms of time budgeting and travel money. Under desired preferences, accessibility is determined by how much time and money people are willing to spend traveling to and from work (Chen, 2016).

According to Levine et al., (2012), accessibility takes into account the multidimensional barriers preventing people from fully participation in society (instead of only physical mobility barriers). Accessibility promotes travel demand as the desire to reach destinations, as opposed to mobility which focuses on travel itself.

Van Wee and Geurs (2011) focus on the underlying causes of social exclusion under four categories (transport system, land use system, individual, and time). The CA framework supports utilizing accessibility to explore TRSE since it represents people's ability to access opportunities and services. According to CA, capability is determined not just by socioeconomic situations, but also by socio-demographic factors, material resources, as well as environmental conditions (Al-Rashid et al., 2010; Chen, 2016).

Measuring accessibility involves then evaluating the performance of transportation systems in connecting individuals to key destinations such as workplaces, healthcare facilities, educational institutions, and social spaces. Methods for assessing accessibility include:

- **Spatial Analysis :** Geographic Information Systems (GIS) can be used to map the spatial distribution of services and the transportation networks that connect people to these services. Spatial analysis allows for the identification of "transport deserts" where services are sparse or non-existent (Farrington and Farrington, 2005).
- **Travel Time and Cost :** Assessing the time and financial costs associated with using transportation to access essential services provides insight into the economic and temporal aspects of accessibility. This approach can highlight disparities in access among different socioeconomic groups (Levine, Grengs, Shen, and Shen, 2012).
- **Service Frequency and Coverage :** Evaluating the frequency of service and coverage of transportation networks helps determine the reliability and convenience of public transit, impacting individuals' ability to access services and participate in community life (Currie, 2010).

Accessibility is a crucial measure for understanding and mitigating TRSE, offering a comprehensive framework for evaluating how transportation systems serve the needs of diverse populations. Accessibility is a pivotal measure in the fight against TRSE for several reasons:

- **Enabling Socioeconomic Participation:** Improved accessibility increases individuals' opportunities for employment, education, and healthcare, thereby supporting broader social and economic inclusion (Lucas, 2012).
- **Equity Considerations:** Focusing on accessibility highlights issues of equity in transportation planning, ensuring that the needs of marginalized and vulnerable populations are considered in the development and provision of services (Martens, 2016).
- **Policy Development and Evaluation :**Accessibility serves as a valuable metric for policymakers and planners in the development, implementation, and evaluation of transportation policies aimed at reducing social exclusion. It provides a concrete measure against which improvements can be assessed and adjusted over time (Preston and Rajé, 2007).
- **Community and Individual Well-being:** Beyond economic and practical considerations, accessibility contributes to community cohesion and individual well-being by facilitating social interactions and access to recreational activities, enhancing the quality of life for all citizens (Stanley and Vella-Brodrick, 2009).

2.5.4. Activity-space as a measure for TRSE

The concept of "activity-space" has emerged as an innovative measure for assessing TRSE, offering insights into the spatial and temporal dimensions of individuals' daily activities and their accessibility through transportation systems. Since the development of technologies for gathering and analyzing spatial data in recent years, recent studies have used activity space as a TRSE measure (Schönfelder and Axhausen, 2003; Wang, 2007; Manaugh and El-Geneidy, 2012; Kamruzzaman and Hine, 2012).

Activity space refers to the area within which individuals conduct their daily activities, such as work, education, shopping, healthcare, and leisure. The size and diversity of an individual's activity space are influenced by several factors, including the availability and accessibility of transportation options, socioeconomic status, and individual mobility capacities (Schönfelder and Axhausen, 2003). Horton and Reynolds (1971) defined activity space as the geographic area occupied by individuals or households during a particular period. Using age, gender, and income as factors, Schönfelder and Axhausen (2003) calculate and compare three measures of activity space.

According to the researchers, some of these sociodemographic variables have no statistical significance when they are modeled to determine the effect they have on activity spaces. Kamruzzaman and Hine (2012) examined the relationship between rural area transportation disadvantage and activity space size, concluding that activity space alone is not an indicator of TRSE (Miller, 2003; Sherman et al., 2005; Kamruzzaman and Hine, 2012). If an individual's residence is in a mixed-use walkable environment, even with a small activity space, most discretionary services and activities may still be available to them locally. Activity space and accessibility are connected in this way. According to the concept of accessibility, an individual's "access level" normally happens within a specific spatial range. Thus, accessibility can be calculated based on an individual's activity space.

As Sehatzadeh (2017) points out when studying accessibility, many researchers and policymakers focus on access to certain opportunities or services; and space-time accessibility prisms are another tool for identifying disadvantaged populations. Space-time accessibility measurements, first proposed by Hägerstrand (1970), explain how activities are organized in geographic space depending on time limitations. These measures analyze an individual trajectory in time and space based on a few predefined places that are necessary activities and a time budget for these activities; as a result, a space-time prism is created (Casas et al., 2009). Basic space-time prisms have been refined further by including choice activities between mandated activities, delay and waiting time, and income aspects. Taking into account both mandatory activities and discretionary activities can facilitate the assessment of TRSE. By examining the extent and variety of activity spaces, researchers can gain insights into how transportation systems facilitate or hinder participation in societal activities.

Activity-space analysis offers a nuanced and dynamic perspective on TRSE, emphasizing the importance of mobility and accessibility in shaping individuals' participation in society. It provides a valuable lens for examining TRSE by highlighting the spatial and mobility barriers individuals face in accessing essential services and participating in everyday activities. Key implications for understanding TRSE include:

- **Identifying Mobility Gaps :** By comparing the activity spaces of different demographic groups, researchers can identify disparities in access to transportation and opportunities,

shedding light on the populations most affected by TRSE (Fan, Guthrie, and Levinson, 2012).

- **Informing Transportation Planning :** Understanding the diversity and extent of activity spaces can inform the development of transportation systems that better meet the needs of all users, particularly marginalized populations. This includes designing services that improve connectivity to key destinations and expanding options for underserved areas (Cass, Shove, and Urry, 2005).
- **Enhancing Social Inclusion :** By facilitating broader and more diverse activity spaces, inclusive transportation policies can contribute to greater social inclusion, enabling individuals to engage more fully in economic, social, and cultural life (Larsen, El-Geneidy, and Yasmin, 2013).

Assessing activity space involves mapping the locations and frequency of individuals' activities and analyzing the transportation modes used to access these locations. Methodologies for measuring activity space include:

- **Travel Diaries and Surveys:** Participants record their daily travel activities, destinations, modes of transportation, and travel times. This data provides detailed insights into the spatial extent of individuals' activity spaces and the role of transportation in enabling or constraining their activities (Shoval and Isaacson, 2007).
- **GPS Tracking and Smartphone Applications:** Advances in technology have enabled the use of GPS devices and smartphone applications to collect precise and continuous data on individuals' movements and activities. This approach offers a more objective and comprehensive view of activity spaces compared to self-reported travel diaries (Zhao, 2015).
- **GIS and Spatial Analysis:** Geographic Information Systems (GIS) are used to visualize and analyze the collected data, allowing researchers to identify patterns, such as areas of high activity concentration or transportation deserts that limit activity space. GIS can also model the accessibility of different locations within an individual's activity space (Kwan, 1999).

2.6. Integrative Analysis of Social Exclusion and Transport Disadvantage

An integrative analysis of social exclusion and transport disadvantage provides a comprehensive understanding of how transportation systems can both contribute to and mitigate social exclusion. This approach considers the interplay between various forms of social exclusion and the role of transportation in shaping access to essential services and opportunities.

Social exclusion is a multidimensional process that prevents individuals or groups from fully participating in societal activities. Transport disadvantage, defined as the lack of access to adequate transportation options, is both a cause and a consequence of social exclusion. Lucas (2012) emphasizes that transport disadvantage can exacerbate social exclusion by limiting access to employment, education, healthcare, and social networks. Conversely, existing social exclusion factors—such as low income, disability, or living in remote areas—can make it difficult for individuals to access or afford transportation.

Social exclusion and transport disadvantage have complex and multidimensional links (Lucas, 2004a). Transport disadvantaged individuals may not necessarily be socially excluded. A socially excluded person can be transport disadvantaged or not. Both issues, however, have a significant positive relationship. This integrative analysis of social exclusion and transport disadvantage underscores the importance of transportation in facilitating or hindering social inclusion. The main mechanisms linking transport and social exclusion are:

- **Accessibility:** Lack of physical accessibility to transportation services, due to poor infrastructure design or inadequate service provision, directly impacts individuals' ability to access jobs, services, and social activities (Geurs and Van Wee, 2004). Accessibility and mobility play a significant role in shaping individual choices of activities and participation in those activities (Currie et al., 2009, Stanley and Lucas, 2013; Adeel, 2015). Poor access to transportation affects access to services and goods, education, and employment. As a result of social exclusion, a variety of transportation strategies and non-transport alternatives are considered as means to promote mobility and access to services and goods.

- **Affordability:** The cost of transportation can be prohibitive for low-income individuals, further limiting their mobility and exacerbating economic and social exclusion (Currie, 2010). The issue of transport disadvantage has been increasingly recognized as an important cause for individuals' social exclusion. In certain circumstances, individuals may be unable to pay for the economic or physical trip cost, or activities they want are not nearby (Church et al., 2000). Several studies have referred to transportation as a social policy concern because it impacts both an individual's capacity to obtain services and social policy success by facilitating or constraining links between services and users (Kenyon, 2003).
- **Availability:** Inadequate availability of transportation services, particularly in rural or underserved urban areas, restricts mobility options and contributes to geographical isolation (Farrington and Farrington, 2005). Minorities and low-income groups not only receive less governmental funding for transportation, but they also pay disproportionate expenses. As a result, transportation's adverse impacts are not dispersed uniformly across society. Disadvantaged groups are often those who pay directly for other people's mobility through their quality of life and health.
- **Safety and Security:** Concerns about personal safety and security while using public transportation can deter individuals from accessing transportation services, impacting their social and economic participation (Loukaitou-Sideris, 2006). As long as the infrastructure or services for the disabled are designed - whether physically or mentally - whatever advantages they provide (such as ease of access or an information's easier explanation) can be beneficial to all, or at the very least cover a specific population needs (i.e. the elderly). Designing a system specifically for a group while making it universal for all people is the goal. Di Ciommo and Shiftan (2017) believe that this will mark a paradigm shift in which the universalism of transportation commodities supply clashes with individualist wishes.

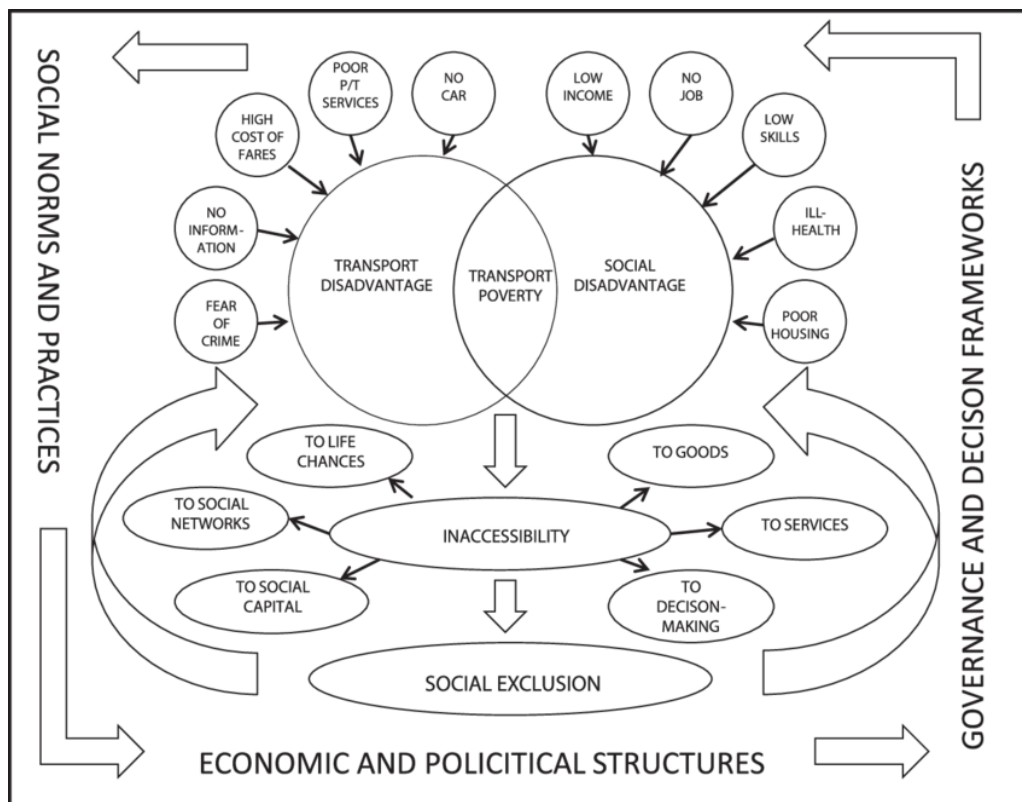


Figure 2.3. Relationship between transport disadvantage and social exclusion

To address the key mechanisms through which transport impacts social exclusion, policymakers and planners can develop targeted strategies for mitigating TRSE:

- **Enhancing Accessibility:** Implementing universal design principles in transportation planning and infrastructure development can improve physical accessibility for all users, including those with disabilities and older adults (Imrie, 2000).
- **Improving Affordability:** Introducing fare subsidies, reduced fare programs for low-income riders, and other affordability measures can make transportation more accessible to economically disadvantaged groups (Currie and Delbosc, 2011).
- **Expanding Availability:** Increasing the coverage and frequency of public transportation services, especially in underserved areas, is critical for reducing geographical isolation and improving access to opportunities (Lucas, 2012).
- **Ensuring Safety and Security:** Enhancing safety and security measures on public transportation can encourage wider use of transit services, particularly among vulnerable populations (Loukaitou-Sideris, 2006).



3. TRANSPORTATION DYNAMICS IN DEVELOPING COUNTRIES WITH A FOCUS ON ABIDJAN

Transportation in developing countries and African cities is a complex and multifaceted topic. Transportation is a fundamental driver of socioeconomic development, influencing economic growth, social equity, and sustainable development. Policymakers and planners must carefully consider the multifaceted impacts of transportation systems to ensure that they contribute positively to socio-economic development while minimizing negative environmental and social impacts. Transportation systems have undergone significant changes and development over the years. Despite there have been notable developments, various challenges persist, especially for marginalized social groups.

3.1. Transportation and Socioeconomic Development

Transportation plays a pivotal role in socioeconomic development by facilitating the movement of goods and people, influencing urbanization patterns, enhancing access to markets, employment, education, and healthcare, and contributing to the overall quality of life. Transportation is essential to economic growth in developing nations. Well-developed transportation systems facilitate trade, enhance productivity, attract investments, and support the movement of goods and services, contributing to overall economic growth and prosperity.

Improved transportation connectivity between rural and urban areas can foster agricultural development by enabling the efficient transport of agricultural products to markets. The intricate relationship between transportation and socioeconomic development can be understood through various lenses, including economic growth, social equity, and sustainable development.

3.1.1. Historical perspective and economic opportunities

Transportation developments since the Industrial Revolution have been instrumental in opening up growing economic opportunities. These developments have occurred in stages, with each stage characterized by innovations in transportation technology that have significantly influenced the economic, market, and social opportunities available at the time.

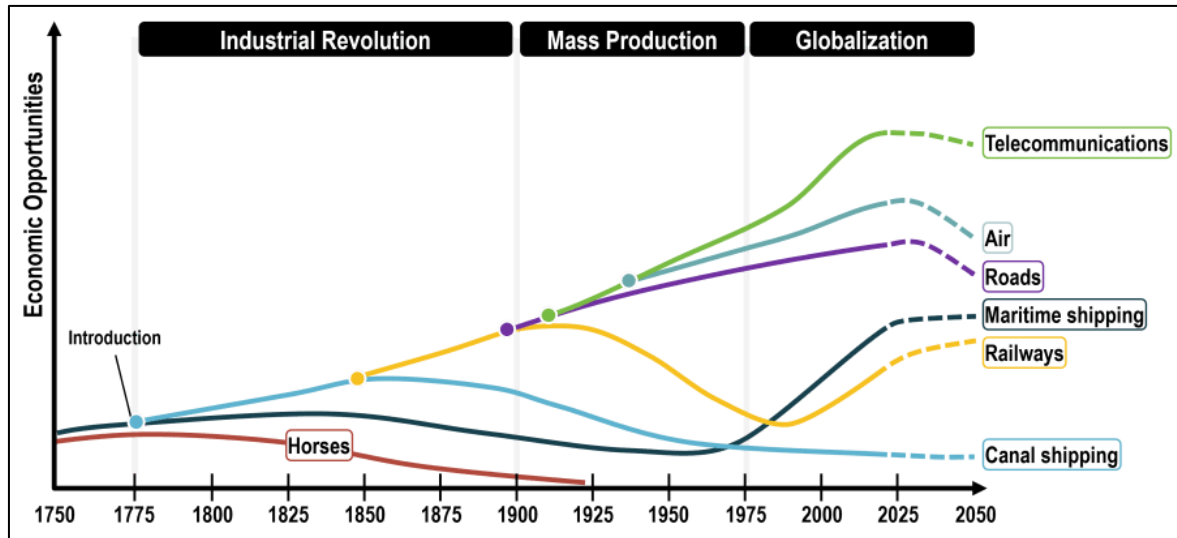


Figure 3.1. Cumulative modal contribution to economic opportunities

The history of economic development can be delineated through major waves where specific transport technologies played pivotal roles:

- Seaports: Facilitated early international trade and the development of colonial empires. Their importance has only increased with globalization and containerization, supporting global trade and supply chains.
- Rivers and Canals: Enabled the development of inland distribution systems, crucial during the early stages of the Industrial Revolution.
- Railways: Opened up substantial economic and social opportunities through resource extraction, settlement of regions, and increased mobility of freight and passengers during the second stage of the Industrial Revolution.
- Roads: The development of road transportation systems in the 20th century, particularly after World War II, significantly contributed to economic opportunities through reliable door-to-door deliveries and facilitated new forms of social opportunities like suburbanization.
- Airways and Information Technologies: Supported the accelerated mobility of passengers and specialized cargoes, crucial for economic globalization in the latter half of the 20th century (Rodrigue et al., 2020).

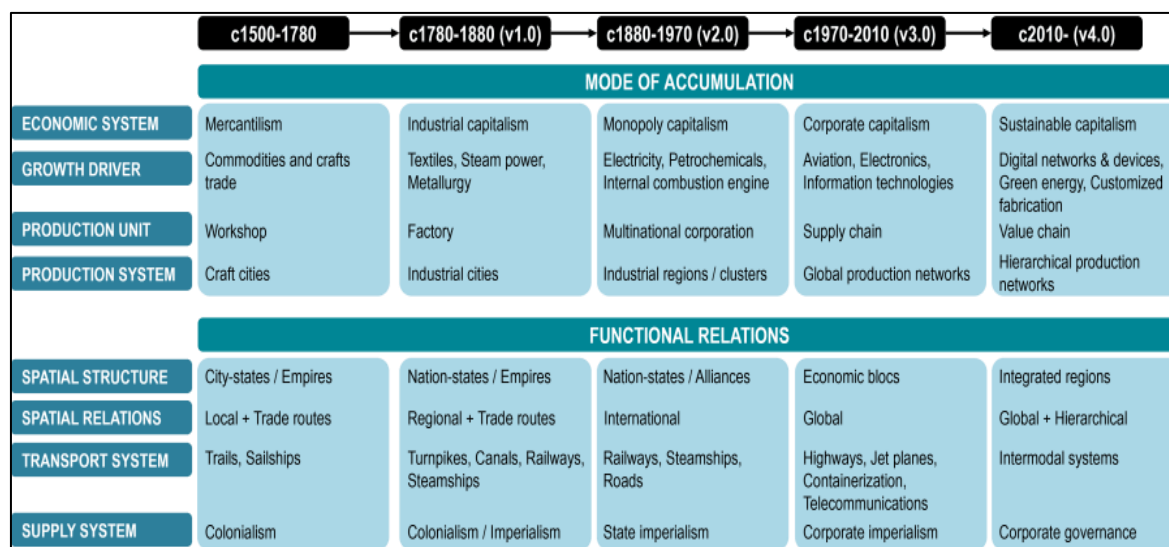


Figure 3.2. Phases of development of the global economy

Transportation is a fundamental pillar in the socioeconomic development of regions and nations, acting as both a driver and indicator of economic growth. The evolution and expansion of transportation systems have historically been closely tied to economic opportunities, societal advancements, and the overall vitality of economies.

Transportation is integral to the socioeconomic development of societies, influencing economic opportunities, social interactions, and the competitiveness of regions. Strategic investments in transportation infrastructure can lead to a multitude of benefits, underscoring the importance of considering transport development within the broader context of socioeconomic planning and policy-making.

3.1.2. Economic growth and transport investments

Transport investments are expected to generate economic returns that justify the capital invested. The direct impacts of such investments typically relate to capacity and efficiency improvements, resulting in time and cost savings for both users and operators. Indirect impacts often involve accessibility gains and better economies of scale, leading to productivity gains across various sectors. Furthermore, induced benefits relate to economic multipliers and increased opportunities, with society benefiting from increased mobility and an economy becoming more competitiv

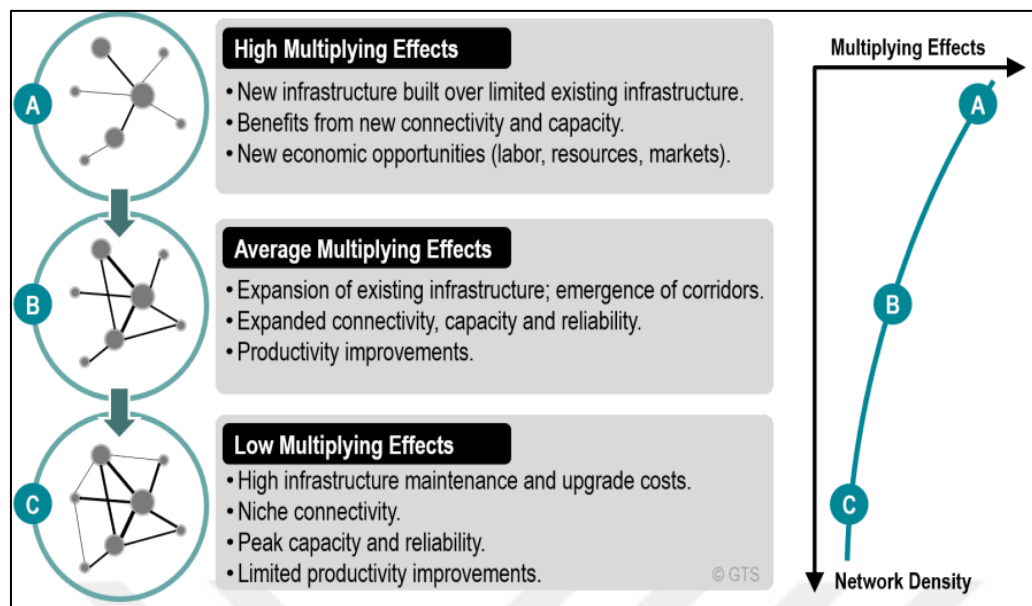


Figure 3.3. Diminishing returns of transport investments

However, the extent of economic benefits can vary significantly depending on the specific modes and locations of transportation infrastructure. While initial investments in transport infrastructure can have high returns by providing new mobility options and enhancing economic competitiveness, the marginal returns tend to decline as the transportation system becomes more developed. This diminishing return is due to factors such as high existing infrastructure accumulation, economic changes shifting from manufacturing to service-oriented sectors, and clustering effects that create advantages in certain locations that cannot be readily reversed by improvements in accessibility.

3.1.3. Enhancing market access and attracting investment

Transportation infrastructure, such as roads, railways, ports, and airports, is a fundamental component of economic development. It enables efficient movement of goods and labor, reduces transportation costs, and enhances competitiveness and productivity.

Improved transportation systems expand market access, enabling businesses to reach wider markets, access raw materials more efficiently, and reduce costs associated with distance and time. This expansion is crucial for economic diversification and industrialization (Rodrigue et al., 2020).

Quality transportation infrastructure is a key factor in attracting foreign direct investment (FDI). Efficient transport systems signal to investors a country's readiness for business and commerce, facilitating economic growth (Serebrisky et al., 2016).

3.1.4. Socioeconomic benefits

Transportation improvements generally increase the scale and scope of economic (mostly freight) and social interactions (mostly passengers), conveying a wide range of economic benefits.

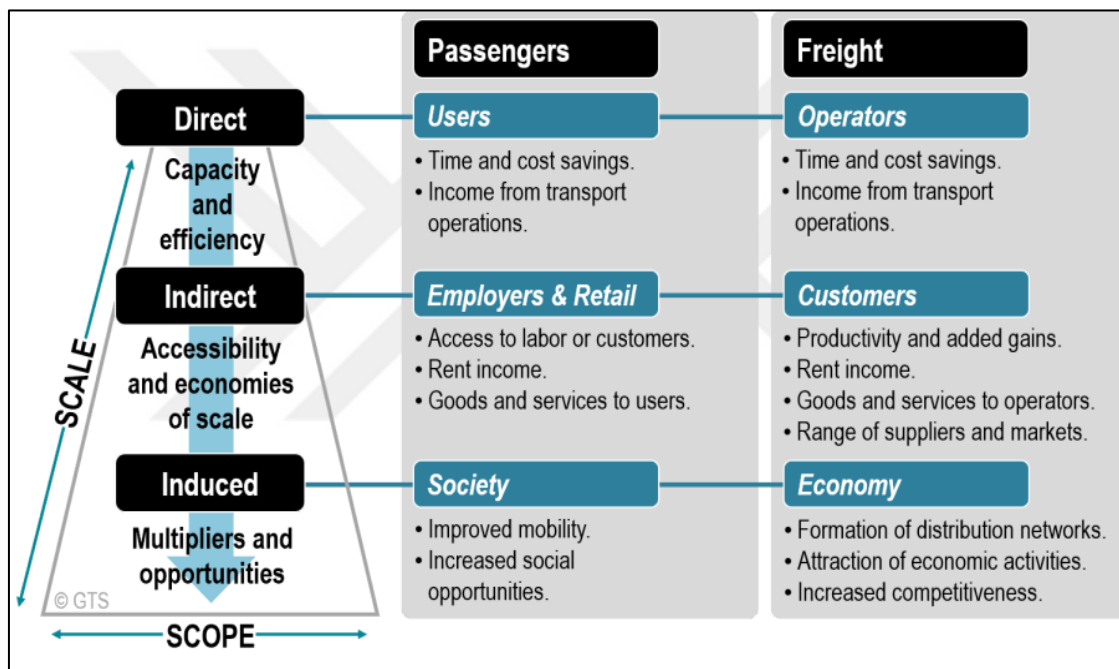


Figure 3.4. Socioeconomic benefits of transportation

These benefits can be direct, such as capacity and efficiency improvements; indirect, like accessibility gains and better economies of scale; or induced, including economic multipliers and increased opportunities. Such improvements impact both transport supply and demand, as well as the broader economy:

- **Social Equity and Accessibility:** Transportation also plays a crucial role in promoting social equity by improving accessibility to essential services and opportunities. This aspect of transportation is critical for reducing social exclusion and enhancing quality of life. The role of transportation in daily life is vital since it enables people to access services and opportunities scattered across time and space. A lack of mobility and

accessibility severely affects peoples' lives and often exacerbates the exclusion of disadvantaged individuals. Furthermore, they are considered to substantially impact social policy's overall performance (Adeel, 2015).

- **Improving Access to Education and Healthcare:** Transportation systems directly impact individuals' ability to access educational institutions and healthcare services. In developing countries, lack of transportation often hinders access to these critical services, perpetuating cycles of poverty and social exclusion (Lucas, 2012). Improved evaluation models effectively capture the wide-ranging benefits of enhanced transportation, particularly for socially excluded groups such as improved health outcomes, increased employment opportunities, enhanced community connectivity, relationship building, and mental well-being (Stanley and Lucas, 2008).
- **Facilitating Employment and Opportunities:** By connecting people with job markets, transportation systems can significantly influence employment rates. This is particularly important in regions where jobs are concentrated in urban centers, far from residential areas (Kawabata and Shen, 2007). Transport investments can have varied impacts on trade and specialization across different regions. In India, colonial railways increased trade flows and raised real income per unit of land area during the colonial period (Donaldson, 2018).
- **Sustainable Development:** The relationship between transportation and socioeconomic development is also framed within the context of sustainability. As the demand for transportation grows with economic development, concerns about environmental degradation, resource depletion, and climate change become increasingly pertinent.
- **Promoting Sustainable Mobility:** Insufficient mobility can prevent individuals from accessing opportunities, social connections, services, and commodities, which can result in social exclusion (Václav, 2017). Sustainable transportation systems, such as public transit, cycling, and walking infrastructure, not only contribute to reducing congestion and pollution but also support inclusive growth by providing affordable and accessible mobility options for all segments of the population (Litman, 2015).
- **Enhancing Resilience and Reducing Vulnerabilities:** Investing in resilient transportation infrastructure can mitigate the impacts of natural disasters and climate change on economic activities and communities, particularly in vulnerable regions (Hallegatte et al., 2013). In Ghana, approximately 50% of the population resides in rural areas, which face various challenges including inadequate rural roads and high petroleum prices (Asomani-

Boateng et al., 2015). These factors restrict access to essential services such as primary healthcare, education, nearby shopping, clean water, and socio-economic opportunities for rural communities. Insufficient and unreliable transportation further hampers households engaged in cash and accessing social services.

3.2. Challenges in Transportation within Developing Countries

Transportation challenges in developing countries are multifaceted, requiring comprehensive and context-sensitive solutions. These challenges should be addressed through integrated planning, innovative financing, and improved governance; and a focus on sustainability and equity is essential to create efficient, accessible, and inclusive transportation systems. There exist several key challenges in transportation within developing countries. In the developing world, this myriad of challenges faced by transportation systems hinders their efficiency and effectiveness. These challenges are often interrelated, stemming from rapid urbanization, inadequate infrastructure, limited financial resources, and governance issues. Addressing these challenges is a must for improving accessibility, promoting socioeconomic development, and enhancing the quality of life by incorporating insights into policy and planning implications.

3.2.1. Infrastructure inadequacies

Developing countries frequently grapple with transportation infrastructure that is either insufficient or in disrepair. The lack of well-maintained roads, bridges, public transit facilities, and other critical infrastructure components can severely limit mobility and access to essential services. The World Bank (2017) highlights how infrastructure gaps in Sub-Saharan Africa, including Côte d'Ivoire, constrain economic growth and access to opportunities.

Infrastructure inadequacies in developing countries encompass a broad spectrum of issues, from insufficient road networks and public transportation facilities to the lack of maintenance and modernization of existing infrastructure. The absence of efficient transport systems exacerbates inequalities, limiting access to employment, education, healthcare, and other essential services (Salazar-Serna et al., 2023). These shortcomings not only impede the efficient movement of goods and people but also exacerbate social inequalities and hinder

economic development. Overcoming these challenges is essential for fostering economic growth, reducing social inequalities, and achieving sustainable development goals. These inadequacies in the developing world may be addressed through a multifaceted approach that combines increased investment, improved governance, sustainable development principles, and technological innovation.

These infrastructure inadequacies are caused by issues such as limited financial resources, rapid urbanization, and institutional weaknesses. According to Estache and Fay (2007), many developing countries face budget constraints that limit their ability to invest in infrastructure development and maintenance. The high costs associated with infrastructure projects often exceed the available public funds, leading to underinvestment. The swift pace of urbanization in developing countries outstrips the capacity of existing infrastructure and overwhelms planning and development efforts. As cities expand, the demand for transportation infrastructure grows, widening the gap between supply and demand (Cohen, 2006). Weak governance and institutional capacities can lead to inefficient planning, allocation of resources, and execution of infrastructure projects. Corruption and lack of transparency further exacerbate these challenges, hindering the development and maintenance of transportation infrastructure (Serebrisky et al., 2016).

These challenges lead to consequences for transportation systems. Poor infrastructure limits access to markets increases transportation costs, and reduces competitiveness, thereby constraining economic growth and development (Rodrigue, 2020). Inadequate transportation infrastructure disproportionately affects marginalized and low-income populations, limiting their access to employment, education, healthcare, and other essential services. This exacerbates social exclusion and inequality (Lucas, 2012). Public transportation systems in developing countries often suffer from operational inefficiencies, overcrowding, and inadequate coverage. These issues disproportionately affect marginalized social groups, including low-income communities, women, children, and people with disabilities (Berg et al., 2017). Inefficient and outdated transportation infrastructure can lead to increased pollution and greenhouse gas emissions. The reliance on road transport, in particular, contributes to environmental degradation and climate change (Pucher et al., 2007)

Investments in infrastructure are essential for closing these gaps and fostering inclusive development. To overcome these issues, increased investment or mobilizing additional

financial resources for infrastructure development is crucial. This can be achieved through public-private partnerships (PPPs), international funding, and innovative financing mechanisms (Estache and Iimi, 2011). Enhancing institutional capacities and governance structures can lead to more efficient planning, implementation, and maintenance of transportation infrastructure. Adopting best practices and learning from successful models in other developing countries can inform these efforts (Sager, 2011). Prioritizing sustainable transportation options, such as mass transit systems, non-motorized transport, and low-emission vehicles, can address both environmental and social concerns. Ensuring that infrastructure development is inclusive and meets the needs of all segments of the population is essential for reducing social inequalities (Litman, 2015). Advances in technology offer opportunities for improving transportation infrastructure efficiency and sustainability. Intelligent transportation systems (ITS), for example, can enhance traffic management, reduce congestion, and improve the reliability of public transit (Pucher et al., 2007).

3.2.2. Funding limitations

Transport infrastructure in developing countries often faces challenges such as inadequate coverage, poor maintenance, and limited accessibility, which can hinder economic growth and contribute to social exclusion (Gram-Hansen et al., 2019). A significant barrier to improving transportation infrastructure and services in developing countries is the scarcity of financial resources. Limited public budgets, challenges in attracting private investment, and the high cost of infrastructure projects contribute to funding limitations. Leveraging innovative financing mechanisms, such as public-private partnerships (PPPs) and international development loans, can provide essential capital for transportation projects (Estache and Iimi, 2011).

Funding limitations stand as a significant barrier to the development and maintenance of transportation infrastructure in developing countries. These constraints not only impede the expansion of necessary transportation networks but also affect the quality and sustainability of existing infrastructures. Funding limitations are caused by multifaceted issues. Developing countries often face constrained public budgets due to lower tax bases, high levels of public debt, and competing priorities for social services such as health and education. These factors limit the amount of public funding available for transportation projects (Flyvbjerg, 2014). While public-private partnerships (PPPs) have been touted as a

solution to funding gaps, attracting private investment in transportation projects can be challenging due to perceived risks, uncertain returns, and regulatory environments that may deter private sector involvement (Engel, Fischer, and Galetovic, 2014). In some cases, available funds are not efficiently utilized due to poor project planning, cost overruns, and corruption. This inefficiency reduces the overall effectiveness of investments in transportation infrastructure (World Bank, 2017).

Insufficient funding can lead to delays in the completion of transportation projects or result in incomplete infrastructure, which fails to meet the needs of the population (Flyvbjerg, 2014). Without adequate funding for maintenance, existing transportation infrastructure can degrade over time, leading to safety hazards, increased operational costs, and reduced service quality (Pucher, et al., 2007). Funding limitations often result in inequitable transportation services, where investments are concentrated in areas with higher economic returns, leaving marginalized communities with inadequate access to transportation (Lucas, 2012).

Overcoming funding limitations requires a multifaceted approach that includes diversifying funding sources, improving the investment climate for private sector participation, leveraging international financing, and adopting cost-efficient transportation solutions. Exploring alternative funding sources such as fuel taxes, road tolls, and transportation utility fees can provide additional revenue streams for transportation projects (Serebrisky et al., 2016). Improving the regulatory and institutional framework for PPPs can make transportation projects more attractive to private investors. This includes establishing clear rules, reducing bureaucratic hurdles, and ensuring fair risk-sharing mechanisms (Engel, Fischer, and Galetovic, 2014). Developing countries can seek financial support from international development banks and donor agencies, which often provide loans and grants with favorable terms for transportation projects (Estache and Iimi, 2011). Prioritizing cost-efficient transportation solutions, such as bus rapid transit (BRT) systems or non-motorized transportation infrastructure, can stretch limited funds further and provide immediate benefits to the population (Cervero, 2013). Engaging local communities in the financing of transportation projects through mechanisms like microfinancing or community cooperatives can enhance local ownership and ensure the sustainability of projects (GIZ, 2013).

3.2.3. Rapid urbanization

Rapid urbanization presents both challenges and opportunities for transportation systems in developing countries. It is a defining feature of many developing countries, driven by a search for better economic opportunities, improved access to services, and other socio-economic factors. While urbanization has its benefits, it also poses significant challenges for transportation systems, often exacerbating existing inadequacies and contributing to new issues. By adopting integrated planning approaches, promoting sustainable transportation, and leveraging technological innovations, cities can address the challenges posed by urbanization and ensure equitable, efficient, and sustainable transportation for all residents.

The swift pace of urbanization in developing countries, particularly in Sub-Saharan Africa, places immense pressure on existing transportation systems. Cities struggle to accommodate the growing demand for mobility, leading to congestion and deteriorating service quality. Integrating land use and transportation planning can mitigate the impacts of urbanization by promoting compact, mixed-use developments that reduce the need for long-distance travel (Cervero and Guerra, 2011).

Urbanization leads to higher population densities, which in turn increases the demand for mobility within cities. The existing transportation infrastructure, often already strained, struggles to accommodate this surge, leading to congestion and reduced service quality (UN-Habitat, 2013). As cities expand spatially to accommodate incoming populations, the distances between homes, workplaces, and essential services increase. This expansion often outpaces the development of transportation infrastructure, creating areas with limited transportation access (Cohen, 2006). Urbanization in developing countries frequently results in the proliferation of informal settlements, where transportation infrastructure is minimal or non-existent. Residents of these areas face significant challenges in accessing employment, education, and healthcare due to the lack of transportation options (UN-Habitat, 2006).



Figure 3.5. Traffic congestion in Bangalore, India

The rapid increase in demand for mobility, combined with inadequate public transportation options, leads to a reliance on personal motor vehicles and, consequently, severe traffic congestion and increased air pollution (Pucher et al., 2007). The uneven development of transportation infrastructure often means that newly urbanized or peripheral areas of cities are underserved. This results in inequitable access to transportation, disproportionately affecting low-income populations (Lucas, 2012). The surge in urban populations puts a significant strain on existing transportation infrastructure, leading to its rapid deterioration. The maintenance and upgrading of infrastructure fail to keep pace with the growing demand, further reducing the efficiency and safety of transportation systems (Estache and Fay, 2007).

Adopting a holistic approach that integrates urban development and transportation planning can ensure that infrastructure development keeps pace with urban growth. This includes planning for mixed-use developments that reduce the need for long-distance travel (Cervero and Guerra, 2011). Encouraging the use of sustainable transportation modes, such as public transit, cycling, and walking, can alleviate congestion and reduce pollution. Investing in public transportation and non-motorized transportation infrastructure is crucial (Litman, 2015). TODs, which focus on creating high-density, mixed-use areas around transit stations, can significantly improve transportation accessibility and reduce reliance on personal motor

vehicles (Calthorpe, 1993). Effective governance and strong institutional capacity are essential for managing urban growth and coordinating transportation infrastructure development. This includes improving regulatory frameworks and enhancing the capacity of local governments (Sager, 2011). Advances in transportation technology, such as intelligent transportation systems (ITS) and mobility-as-a-service (MaaS) platforms, can improve transportation efficiency and accessibility in rapidly urbanizing cities (Pucher et al., 2007).

3.2.4. Governance and institutional weaknesses

Weak governance structures and institutional capacities often impede the planning, development, and maintenance of transportation systems. Issues such as corruption, lack of coordination among agencies, and inadequate regulatory frameworks can stifle progress. Strengthening institutional capacity and governance frameworks is critical for effective transportation planning and management. Transparency, accountability, and public participation in decision-making processes can enhance the legitimacy and effectiveness of transportation policies (Sager, 2011).

Governance and institutional weaknesses significantly impact the development, maintenance, and efficiency of transportation systems in developing countries. These weaknesses stem from a range of factors including inadequate regulatory frameworks, lack of coordination among agencies, corruption, and insufficient capacity for planning and implementation. Improving governance and strengthening institutional capacities are essential for addressing the myriad challenges facing transportation systems in developing countries. By adopting some strategies, countries can build more efficient, equitable, and sustainable transportation systems that support broader socioeconomic development goals.

Developing countries often lack comprehensive and enforceable regulatory frameworks for transportation. This includes regulations governing land use, transportation safety standards, environmental protections, and public-private partnerships (PPPs) (World Bank, 2007). The absence of such frameworks can lead to haphazard development and inefficient transportation systems. Transportation development often involves multiple government agencies, each with its priorities and agendas. The lack of coordination and coherent policy direction among these entities can result in conflicting strategies, duplicative efforts, and

wasted resources (Pucher et al., 2005). Corruption and mismanagement within transportation projects and operations can divert scarce resources away from critical investments, inflate project costs, and undermine the quality and sustainability of transportation infrastructure (Transparency International, 2008). Many developing countries face challenges in planning, implementing, and maintaining transportation projects due to insufficient technical, financial, and administrative capacity. This includes a lack of skilled personnel, inadequate financial management systems, and poor maintenance practices (Estache, 2010).

Governance and institutional weaknesses contribute to underdeveloped and inefficient transportation infrastructure, characterized by incomplete projects, poor maintenance, and inadequate service provision. These weaknesses often lead to inequitable access to transportation, where investments are not aligned with the needs of underserved communities, exacerbating social and economic inequalities. Without effective governance and regulatory enforcement, transportation development can result in significant environmental damage, including pollution and unsustainable land use patterns.

Developing and enforcing comprehensive regulatory frameworks for transportation can provide clear guidelines for development, ensure safety and environmental standards, and facilitate PPPs (Sager, 2011). Establishing mechanisms for coordination among different government agencies and levels of government can improve policy coherence, streamline decision-making, and ensure that transportation strategies align with broader development goals (Rodrigue, 2020). Investing in capacity building for the planning, implementation, and maintenance of transportation projects is crucial. This includes training for government officials, improving financial management systems, and adopting best practices in transportation planning and operations (World Bank, 2017). Implementing measures to increase transparency and accountability in transportation projects can help combat corruption and mismanagement. This includes public reporting of expenditures, independent audits, and mechanisms for public participation and oversight (Transparency International, 2008). Utilizing technology and innovation can enhance the efficiency and effectiveness of transportation systems. This includes adopting intelligent transportation systems (ITS), data analytics for planning and management, and digital platforms for public engagement (Pucher et al., 2007).

3.2.5. Environmental and social concerns

Transportation systems in developing countries must balance the need for mobility with environmental sustainability and social equity. Pollution, greenhouse gas emissions, and the displacement of communities are pressing concerns. Adopting sustainable transportation solutions, such as non-motorized transport (NMT) and low-emission public transit, can address environmental and social challenges while meeting mobility needs (Pucher et al., 2007).

Environmental and social concerns are increasingly central to discussions about transportation in developing countries, given the sector's significant impacts on pollution, greenhouse gas emissions, land use, and community well-being. Addressing these concerns is crucial not only for promoting sustainable development but also for ensuring that transportation systems contribute positively to social equity and environmental preservation. Addressing environmental and social concerns in transportation requires a multifaceted approach that balances the need for mobility with the imperative for sustainability and social equity.

Transportation is a major source of air pollution and greenhouse gas emissions in developing countries, contributing to climate change and adverse health outcomes. Vehicles, particularly those running on diesel and gasoline, emit pollutants such as particulate matter, nitrogen oxides, and carbon dioxide (CO₂) (Schipper et al., 2000). The expansion of transportation infrastructure often leads to land degradation, habitat destruction, and the fragmentation of ecosystems. Road and railway construction can disrupt natural habitats, threaten biodiversity, and reduce the resilience of ecosystems to environmental changes (Forman and Alexander, 1998).

In many developing countries, there is a significant disparity in access to transportation services, with marginalized communities, including the poor, women, and persons with disabilities, often facing greater barriers to mobility. This inequitable access can limit individuals' ability to participate in economic and social activities, perpetuating cycles of poverty and social exclusion (Lucas, 2012). The development of transportation infrastructure can lead to the displacement of communities, particularly in urban areas where land is scarce. The process of land acquisition for infrastructure projects can result in the involuntary

resettlement of people, affecting their livelihoods, social networks, and cultural ties (Cernea, 2000).

Encouraging the use of sustainable transportation modes, such as public transit, cycling, and walking, can reduce reliance on private vehicles and lower emissions. Investments in mass transit systems, bike lanes, and pedestrian pathways can enhance mobility while minimizing environmental impacts (Pucher et al., 2007). Transitioning to clean vehicle technologies, including electric and hybrid vehicles, can significantly reduce pollution and greenhouse gas emissions from the transportation sector. Implementing policies and incentives to promote the adoption of these technologies is critical (Sperling and Cannon, 2004). Coordinating land use and transportation planning can help prevent habitat destruction and reduce the need for extensive infrastructure development. This approach encourages compact, mixed-use development patterns that support sustainable mobility (Cervero and Kockelman, 1997). Involving communities in the planning and decision-making processes for transportation projects can help address social concerns and ensure that projects are designed to meet the needs of all residents. Participatory planning approaches can also mitigate the risks of displacement and ensure fair compensation and resettlement practices (World Bank, 2004).

3.2.6. Informal transportation sector

The informal transportation sector plays a significant role in providing mobility in many developing cities, yet it is often characterized by safety issues, unreliability, and regulatory challenges. In many developing countries, the informal transportation sector plays a crucial role in urban mobility, filling gaps left by formal public transit systems. Cities like Bogotá and Nairobi have integrated informal transport operators into formal transportation planning and offer valuable lessons for improving service quality and regulatory frameworks (Behrens et al., 2016).

The informal transportation sector, which includes a variety of non-regulated services such as minibusses, motorcycle taxis, and auto-rickshaws, is often characterized by its flexibility, accessibility, and affordability. This sector is an indispensable component of urban mobility in developing countries, providing critical services to millions of residents. However, it also faces challenges related to safety, reliability, and integration with formal transportation systems.

Informal transportation often provides services in areas not covered by formal public transit, offering critical mobility options for underserved communities (Cervero and Golub, 2007). These services adapt quickly to changing demand patterns, providing transportation in rapidly growing or informal settlements. For many individuals in developing countries, the informal transportation sector offers important economic opportunities, both as a source of employment and by facilitating access to job markets for riders (Salazar Ferro et al., 2015).

Informal transport services frequently operate without strict adherence to safety standards, leading to higher accident rates and security concerns for passengers (Porter, 2011). The informal nature of these services often results in a lack of regulation, leading to issues such as overloading, unregulated fares, and competition with formal public transportation systems (Behrens et al., 2016). Vehicles used in the informal sector are often older and poorly maintained, contributing significantly to urban air pollution and greenhouse gas emissions (Sperling and Cannon, 2004).

Implementing regulatory frameworks that recognize and integrate informal transportation services can improve safety standards, service reliability, and environmental performance. This approach can also facilitate better coordination between informal and formal transport services (Cervero and Golub, 2007). Providing training programs for informal transport operators can enhance safety and service quality. Training could cover safe driving practices, vehicle maintenance, and customer service (Salazar Ferro et al., 2015). Offering incentives for upgrading to cleaner, more efficient vehicles can help reduce the environmental impact of the informal transportation sector. These incentives could include subsidies, low-interest loans, or tax breaks (Sperling and Cannon, 2004). Including the informal transportation sector in urban mobility planning and policy-making can ensure that these services complement formal transportation systems, enhancing overall urban mobility (Pojani and Stead, 2015). Developing PPPs that involve informal transport operators can leverage their local knowledge and operational flexibility while improving standards and integration with formal transit systems (Behrens et al., 2016).

3.3. The Urbanization Phenomenon in Sub-Saharan Africa

Africa is urbanizing rapidly and the majority of African cities are growing rapidly and unplanned. Increasing urbanization will result in several environmental and social problems

(United Nations, 2014). The urbanization phenomenon in Sub-Saharan Africa (SSA) represents one of the most significant demographic shifts in the region's history, characterized by rapid and often unplanned urban growth. As compared with their population's needs, most cities in Africa show low mobility and accessibility levels while sustainable urban development requires a good level of accessibility and mobility. Addressing these challenges requires comprehensive strategies that promote sustainable urban growth, equitable access to transportation and services, and resilience to environmental changes. This transformation presents both opportunities and challenges for development, particularly in the context of transportation, environmental sustainability, and social equity.

3.3.1. Drivers of urbanization in Sub-Saharan Africa

The urbanization phenomenon presents a complex set of challenges and opportunities for the region's development trajectory. SSA has one of the highest population growth rates globally, contributing significantly to urban expansion. The region's youthful demographic profile further accelerates this trend (United Nations, Department of Economic and Social Affairs, 2019). Thus, policy and decision-makers face a variety of challenges as they plan, develop, and manage their cities.

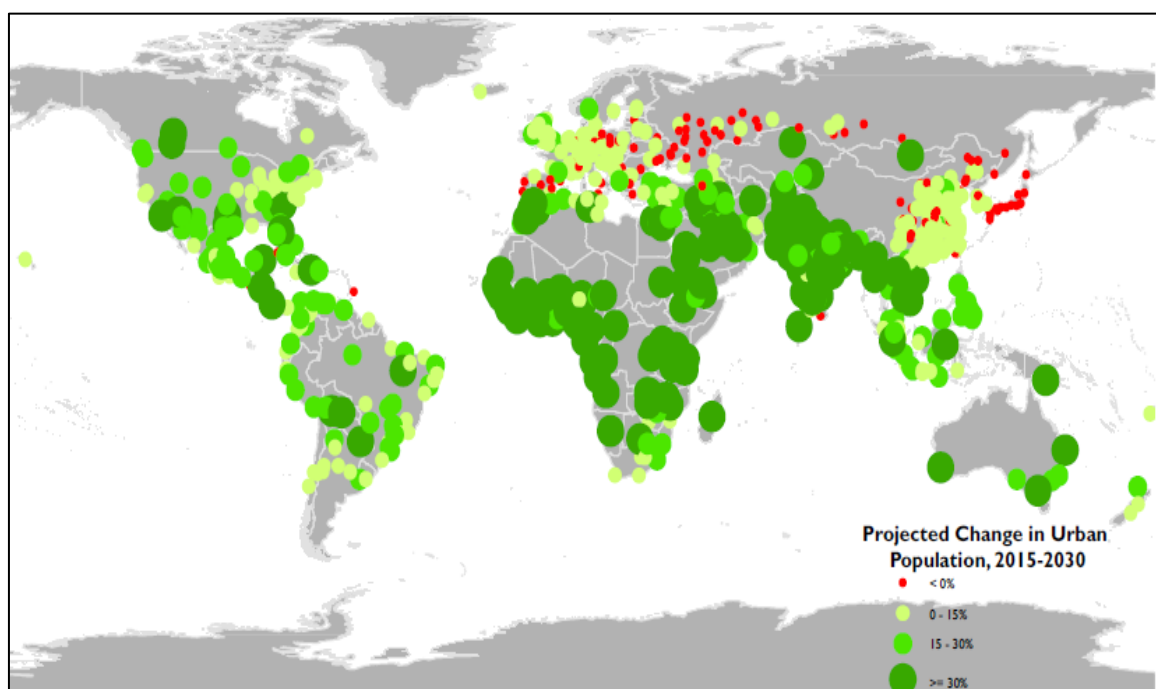


Figure 3.6. Projection in 769 cities urban population change between 2015 and 2025

As the figure shows, Sub-Saharan Africa and South Asia will experience rapid urbanization (more than 30%) by 2030, while European cities will see their urban population decline (less than 0% in some cases). Approximately 414 million people lived in urban areas of Africa in 2011, according to the 2011 revision of the World Urbanization Prospects by the UN Department of Economic and Social Affairs. There are estimates that by 2030, there will be almost 750 million urbanized people, and by 2050, that number will exceed 1.2 billion. For the period 2011-2030, Africa has the highest growth rate for urban populations, with 3.09%, compared to 0.33 in Europe, 0.98 in North America, 1.13 in Latin America, and 1.87% in Asia. Therefore, urbanization and urban population in Africa are expected to increase rapidly in the future (SSATP, 2015).

Many individuals migrate from rural areas to cities in search of better economic opportunities, access to services, and improved living conditions. This migration is a primary driver of urban growth in SSA (Tacoli, 2012). Shifts from agrarian-based economies to more industrialized and service-oriented economies encourage urbanization, as cities become hubs for economic activities and job creation (Bloom et al., 2008). In Africa, 55 % of the urban population lives in less than 500,000 inhabitants' areas, while 65 % lives in less than 1,000,000 residents' cities. More than half of urban dwellers will still live in less than 1 million residents' cities by 2025. As a result, secondary cities have a unique strategic opportunity to address urbanization challenges in a proactive manner (SSATP, 2015).

Table 3.1. 2010-2025 Urban population growth in africa

	10 million or more		5 to 10 million		1 to 5 million		500 000 to 1 million		Fewer Than 500 000	
	2010	2025	2010	2025	2010	2025	2010	2025	2010	2025
Population (millions)	21 820	48 132	8 415	58 408	104 350	172 681	38 317	60 551	227 750	302 651
Percentage of urban population (%)	5,44 %	7,49 %	2,10 %	9,09 %	26,04 %	26,88 %	9,56 %	9,42 %	56,84 %	47,11 %
Number of agglomerations	2	3	1	9	47	81	55	91	-	-

3.3.2. Impacts of urbanization

A lack of urban planning, insufficient provision of basic services, inadequate infrastructures and transportation services, increased pollution and congestion, unregulated traffic, and insufficient technical, financial, and institutional capacity are among the problems in these cities (Africa Transport Policy Program [SSATP], 2015). Rapid urbanization places

immense pressure on existing urban infrastructure, including transportation systems, leading to congestion, pollution, and inadequate service provision (Cohen, 2006). The pace of urbanization often outstrips the ability of governments to provide adequate housing, resulting in the proliferation of informal settlements with limited access to basic services and infrastructure (UN-Habitat, 2006). Urban expansion contributes to environmental degradation, including loss of green spaces, increased pollution, and vulnerability to climate change impacts due to inadequate planning and infrastructure (Douglas et al., 2008).

Often, urban master plans address future travel needs through land-use reservations, but not as structural components of 'city making'. As an example in Abidjan, employment opportunities are located far from residential areas. The urban fabric is not functionally diverse (both across the metropolitan area and within neighborhoods), which means residents have to travel longer distances to get to jobs and access other social and economic opportunities. It is highly challenging for pedestrians and poor people in African urban areas who represent the majority of movement in cities (SSATP, 2015).

3.3.3. Strategies for sustainable urbanization

To address these problems, planners and policymakers are increasingly turning to sustainable policies. Sustainable cities are those that provide affordable housing, healthcare, education, and transportation to their citizens. Typically, many urban areas lack a sustainable spatial development process and long-term vision that considers mobility beyond road construction. It is common for infrastructure projects (e.g. road building, bus stations, highways, etc.) to take precedence over overarching urban planning and integration (SSATP, 2015). Adopting integrated urban planning approaches that link land use with transportation and housing policies can ensure more orderly and sustainable urban growth. Emphasizing compact, mixed-use development can reduce reliance on private vehicles and encourage the use of public transit (Cervero and Kockelman, 1997).

As transportation facilities and travel behavior impact people's quality of life significantly, transportation has long been recognized as an important component of urban sustainability (Chen, 2016). Policies aimed at promoting inclusive urban development can ensure that the benefits of urbanization are equitably distributed. This includes providing affordable housing, access to services, and economic opportunities for all segments of the urban

population (Tacoli, 2012). To ensure transportation sustainability, public transportation accessibility for all, especially minorities and excluded peoples, needs to gain more prominence in transportation projects and become a main goal for major cities' transportation plans.

Urban planning and development strategies must incorporate climate change adaptation measures to enhance cities' resilience to environmental risks. This includes improving stormwater management, enhancing green spaces, and building resilient infrastructure (Bicknell et al., 2009). Expanding and improving public transportation networks can alleviate congestion, reduce pollution, and enhance mobility for all urban residents, particularly those in informal settlements (Pucher et al., 2005). By integrated planning approaches and investing in public transportation and inclusive development, SSA can navigate the urbanization process more effectively, ensuring that cities become engines of growth and prosperity.

3.4. Transport Issues in African Cities

In Sub-Saharan Africa, transportation systems face myriad issues, including but not limited to pollution, congestion, delays, elevated fares, and poor accessibility, culminating in accidents and reduced mobility. The prevalent mode of public transport, known as para-transit, features adaptable schedules and informal routing, which, despite its flexibility, introduces several adverse effects such as safety risks, inadequate service for vulnerable populations, inconsistent and high fares, and environmental degradation (Mfinanga et al., 2015). Historically, the region has also experienced disproportionately high transport costs when compared to global standards, with the cost of shipping per ton-kilometer between Douala and N'Djamena being significantly higher than equivalent distances in the US and France (Berg et al., 2017).

The lack of accessible, affordable, and dependable transportation severely limits mobility, obstructing access to vital services such as healthcare, employment, and education. Factors contributing to this include infrequent and unreliable transport services and personal scheduling constraints, leading to a phenomenon known as 'time-based exclusion,' which restricts individuals' ability to engage in various activities (Bocarejo S and Oviedo H, 2012). The considerable time required for transit contributes to 'time poverty,' leaving insufficient

time for essential daily activities (Farber and Páez, 2011). This issue is exacerbated in fast-growing urban areas like Abidjan, where surging demand for transport services results in chronic congestion, pollution, and a lower quality of life (Tan et al., 2020).

Transportation challenges also encompass societal factors, including psychological and mental health concerns. These issues impede individuals' ability to effectively use transportation and engage in daily activities, manifesting as an inability to drive, the use of poorly designed transport means, unaccommodating facilities for individuals with disabilities, vehicle overcrowding, challenges in interpreting timetables, and inadequate pedestrian infrastructure (Luz and Portugal, 2022). Such barriers disproportionately affect the elderly, individuals with disabilities and the illiterate. Specific impediments include age-related declines in hearing and vision, reduced mobility, slower reflexes, diminished coordination, and the complications of medication side effects (Lira, 2017). Additionally, balance issues can result from the abrupt acceleration and deceleration of vehicles, unsuitable vehicle and seating designs, significant distances to stops, physical exertion, and densely populated environments (Denmark, 1998).

The transportation needs of low-income populations present significant challenges in developing urban areas. Research often focuses on the complex interplay between social disadvantages—such as disability, poverty, or single parenthood—and travel behavior (Lucas et al., 2016). The scarcity of public transportation in many of Africa's rural regions essentially necessitates car ownership. However, lower-income individuals typically depend more on public transit and have less access to personal vehicles, highlighting the link between social exclusion, accessibility, and economic status (Pritchard et al., 2014). Those with lower socio-economic standing often live in areas with limited access, mobility, and land-use diversity. Studies have also indicated that improvements in living standards may inadvertently raise housing costs for low-income families, potentially displacing them to areas more dependent on car transportation (Goossens et al., 2020). The restriction on car usage exacerbates social exclusion, with those lacking private vehicles less likely to engage in leisure activities. Nevertheless, car-sharing initiatives are emerging as a more inclusive solution, gaining popularity, especially among vulnerable demographics in developing nations.

3.5. Transportation for Marginalized Social Groups

Marginalized social groups-including women, low-income families, children, and individuals with disabilities-encounter distinct challenges in accessing transportation. Affordability, accessibility, and safety issues are particularly acute for these demographics, constraining their access to essential services and opportunities.

Women, for instance, face significant safety concerns while utilizing public transportation, which may limit their mobility and increase dependency on private transportation alternatives (Babinard and Scott, 2011). Children often lack secure and accessible routes to school, adversely affecting their educational attainment. In developing nations, the absence of car access is notably prevalent among households led by females, as well as among children, the elderly, ethnic minorities, and individuals with disabilities, who are disproportionately represented in lower-income brackets. Notably, the elderly have shown a preference for Tele-bus services over traditional fixed-route services in Africa, indicating a demand for more tailored transportation solutions (Wang, 2007).

Exclusion based on social position can restrict public movement, with social constraints rooted in gender, race, nationality, age, ethnicity, caste, or religion. Migrants and young individuals often face these barriers (Farrington, 2007; Stanley et al., 2011; Yigitcanlar et al., 2019). Inadequate pedestrian infrastructure further limits accessibility for the elderly and physically disabled, heightening the risk of falls (Ma et al., 2018). Individuals with disabilities encounter significant barriers to physical accessibility and the availability of inclusive transportation options (Currie et al., 2010), which is exacerbated for those with specific physical conditions, such as the elderly, those with disabilities, and pregnant women.

People with disabilities, especially, find transportation barriers to be a significant obstacle to social participation and daily activities. They often have unequal access to essential medical services, particularly in settings with limited resources (Choi et al., 2019). Mobility limitations are the most common disability among the elderly, followed by cognitive impairments, independence limitations, hearing loss, and visual impairments (Okoro et al., 2018). Elderly individuals with disabilities face challenges in accessing healthcare, including the absence of companionship, language and communication barriers, and inconvenient

access. Communication challenges are particularly problematic for those with visual or hearing impairments, potentially restricting their access to necessary healthcare services (Scheier, 2009). Although many are aware of where to obtain healthcare services, only a fraction successfully access them (Okoro et al., 2018).

Mobility limitations significantly hinder access to healthcare due to transportation inaccessibility or inconvenience (Ho et al., 2007). Addressing these challenges, studies suggest policy implications for enhancing disability-friendly public transport, such as accessible stations and vehicles equipped with features like side kneel capability, barrier-free access, alarm bells for boarding and disembarking, and intuitive amenities for individuals with disabilities (Yuan et al., 2022). Moreover, individuals with mobility difficulties possess car ownership rates of about 38%, often traveling less than the general population (Yuan et al., 2022).

Transport-related risks underscore the broader analysis of the Transportation Risk and Safety Environment (TRSE), indicating that impoverished neighborhoods and their inhabitants suffer disproportionately from injuries or fatalities as road users (Kamruzzaman et al., 2016). These areas, often situated near major roads with high-speed traffic, expose residents to increased road traffic dangers, including accidents, fatalities, and pollution. This risk is amplified by a reliance on walking as a primary mode of transport and the lack of safe environments for the young and children.

3.6. Social Exclusion and Transport Disadvantage in the Developing World

Research on transport disadvantage and social exclusion has seen considerable growth in developed countries, highlighting a significant portion of the population as accessibility-disadvantaged and socially excluded. However, this issue is more pervasive in developing nations, where it has garnered less attention. The literature related to this topic is scarce in these regions, where the majority of the population is vulnerable, and the nature of the problems may differ markedly from those in developed countries. This gap in research is often compounded by limited data availability (Adeel, 2015).

Sub-Saharan Africa, along with Asia and other developing regions, is facing challenges such as population booms, rapid urbanization, industrialization, and climate change. These factors

underscore the critical importance of accessibility in sustainable development (Zhang and Yeh, 2011). With limited access to private vehicles, a significant portion of these populations depend on public transport, further exacerbated by the absence of basic amenities within walking distance (World Bank, 2008). Walking remains the predominant mode of transportation in these areas, emphasizing the necessity of having basic amenities nearby (Yeh and Chow, 1996). Consequently, the underserved public transport systems in these nations leave disadvantaged households facing numerous accessibility challenges (Vasconcellos, 2005; Adeel, 2015). To address regional disparities and accurately identify disadvantaged groups, an integrated approach that considers both land use and public transportation is vital.

Globally, physical access challenges persist across both developed and developing nations, albeit due to varying reasons. Individuals in less affluent countries often endure long walks, while those in developed nations face the necessity of car ownership (Hai and Quang, 2022). This reliance on walking can limit engagement in essential activities, while financial burdens associated with mandatory car ownership can restrict access to opportunities. Social stratification traditionally influences the unequal distribution of access to spaces.

Growing global interest aims to tackle transport disadvantage issues in developing countries, where transport expenses disproportionately burden lower-income groups (Venter, 2009). Such households not only spend a larger share of their income on travel but also face higher costs for public transportation compared to wealthier households, a disparity influenced by various factors.

Adeel (2015) identified a strong correlation between severe spatial disadvantages, low income, low education levels, and high crime rates, linking location to participation in extracurricular activities and social inclusion. Farrington argued that accessibility should not be viewed as a binary condition but rather as an evaluation of the extent to which a group of people can engage in activities under certain conditions.

Hai and Quang (2022) highlighted the use of ad hoc methodologies (e.g., job loss) to study marginalized populations, cautioning that insufficient identification of these groups could lead to their needs being underrepresented. Merely improving transportation infrastructure

is insufficient without engaging the affected communities to accurately define their needs and requests.

Spatial disadvantage is dynamic, with access to facilities fluctuating based on time, such as weekends and off-peak hours, due to less frequent transit services and varied facility hours. Lucas (2012) emphasized that perceptions of public transport are influenced by multiple factors, including the quality of transport mode, safety, security, pricing, ticket availability, boarding and exiting convenience, service provider friendliness, and information accessibility. The limited feasibility of certain transport forms can restrict mobility options.

Lucas (2012) also noted that diversity in activities can lead to shifts from central business districts, impacting travel times, distances, and the profitability of transportation modes. He argued that the costs associated with private car ownership might be unnecessary in culturally diverse areas, where factors such as street and sidewalk connectivity, bicycle infrastructure, lighting, topography, neighborhood aesthetics, crime risk, and weather can influence the ease of engaging in activities.

3.7. Côte d'Ivoire: A National Overview

Côte d'Ivoire, a West African nation, has experienced significant political, social, and economic transformations in recent decades. These changes have profound implications for its urbanization, development, and transportation systems.

3.7.1. General overview

Located in West Africa, Côte d'Ivoire is a dynamic country well known for its vibrant economy and diverse cultural heritage. The country is surrounded by the Atlantic Ocean to the South, Ghana to the East, Liberia and Guinea to the West, and Burkina Faso and Mali to the North. With a total area of 322 463 square kilometers, the country has a variety of landscapes, including savannas, mountains, and lush forested areas (Achan Atsain, 2009). The country's population is over 30 million (Estimation from RGPH 2021census), with more than 60 ethnic groups coexisting with distinct languages and traditions.

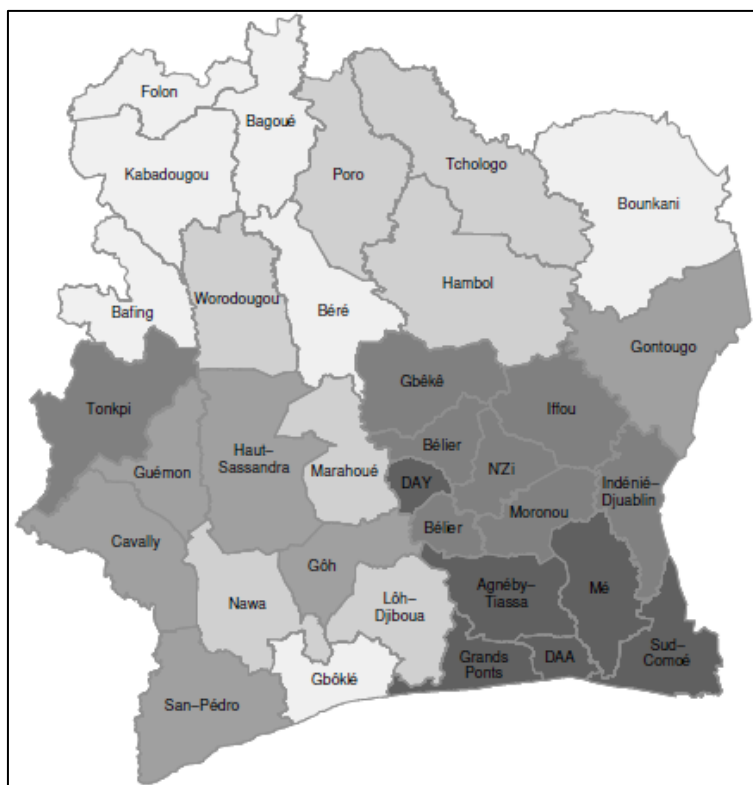


Figure 3.7. Map of Côte d'Ivoire regions and density

In recent years, Côte d'Ivoire experienced significant economic growth, driven by industries such as agriculture, manufacturing, and services. The country's strategic location and natural resources have contributed to its position as a major regional hub for trade and commerce. Being one of Africa's leading countries, Côte d'Ivoire also is the largest exporter of coffee and cocoa beans, as well as palm oil (Ruf, 2011).

According to Ramiaramananana et al. (2021), Côte d'Ivoire is one of the most urbanized Sub-Saharan African countries, with the GAA serving as the country's economic engine. More than half of Côte d'Ivoire's population (56%) resides in urban areas, with urbanization expanding at a 5% annual rate, nonetheless with significant geographical disparities between the GAA and smaller cities. By 2050, the urban population will have increased to two-thirds of the total population.

3.7.2. Economic context and growth

Côte d'Ivoire has emerged as one of the fastest-growing economies in Africa, driven by agricultural production, particularly cocoa, and coffee, which are significant export

commodities. The country has also seen growth in sectors like mining, telecommunications, and services (World Bank, 2020). This economic resurgence, following a period of political instability and conflict in the early 2000s, has contributed to rapid urbanization and increased demand for efficient transportation systems.

The country has shown economic resilience and maintained a positive growth trajectory despite past instability (Lundahl and Ben, 2018). It is the largest economy in francophone Sub-Saharan Africa, and the third-largest in West Africa. With a Gross Domestic Product (GDP) of US\$39.91 billion in 2017, the country had a GDP of 7.7% in 2017 and around 7.4% in 2018, while inflation remains below 3 %.

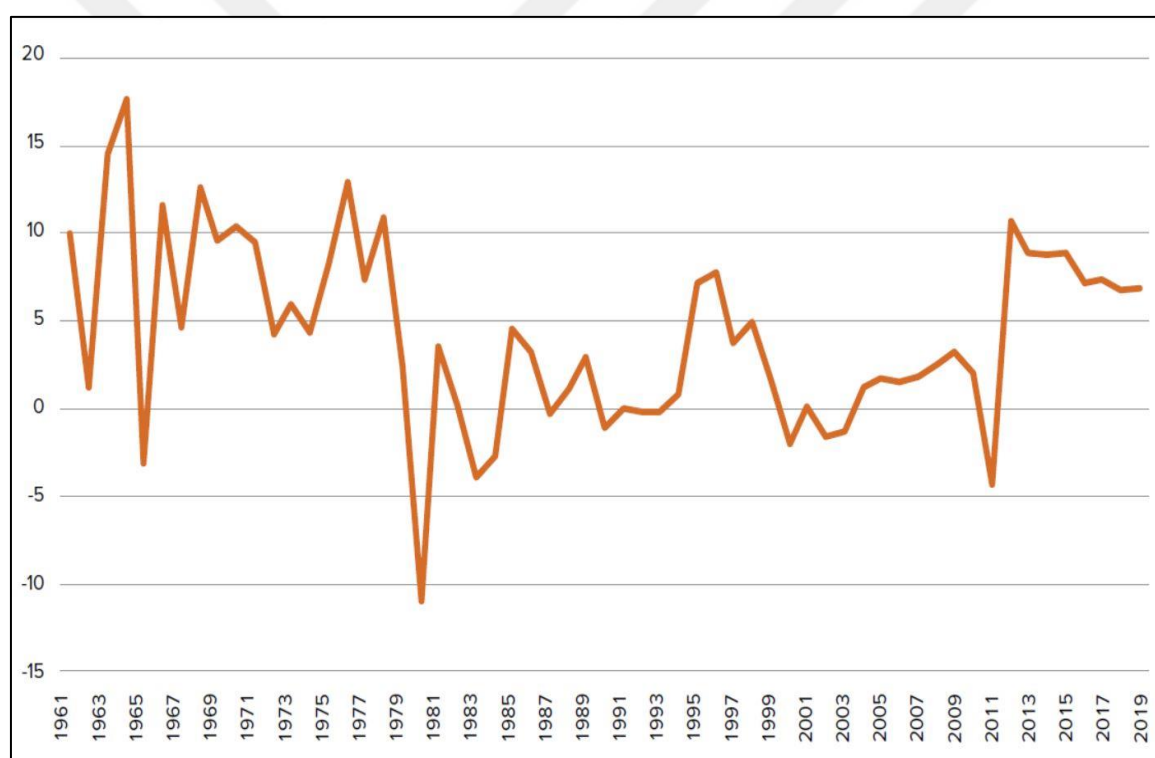


Figure 3.8. GDP growth over the past six decades, 1961–2019

As one of the world's fastest-growing countries, Côte d'Ivoire seeks upper middle-income status by 2030. Côte d'Ivoire is the largest economy among the members (8) of the West Africa Economic and Monetary Union (WAEMU), whose currency is the CFA franc. Côte d'Ivoire's per capita income in 2019 was almost US\$1,700, 50 percent higher than 2011's level.

Côte d'Ivoire, often hailed as a beacon of economic resilience and growth in West Africa, has demonstrated remarkable economic performance over the past decade. Its journey from post-conflict recovery to becoming one of the continent's fastest-growing economies is a testament to its robust economic strategies, diversification efforts, and improved political stability. Côte d'Ivoire's economic context and growth narrative underscore the interplay between economic strategies, urban development, and transportation infrastructure. The country continues to navigate its path toward sustained economic development, addressing existing challenges and leveraging opportunities for inclusive growth.

Economic growth and drivers

Côte d'Ivoire is the world's largest producer and exporter of cocoa beans, a cornerstone of its economy. The agricultural sector, which also includes coffee, palm oil, and rubber, contributes significantly to GDP and employment. The government's efforts to increase productivity, improve supply chain infrastructure, and promote value addition have further bolstered this sector (World Bank, 2020). Recognizing the vulnerabilities associated with reliance on agriculture, Côte d'Ivoire has embarked on economic diversification, particularly in services and manufacturing. The services sector, including telecommunications, banking, and tourism, has seen rapid growth, driven by investment in infrastructure and digital technology. Similarly, the manufacturing sector, focusing on agro-processing, textiles, and construction materials, has benefited from favorable government policies and foreign investment (ADB, 2018). The return to political stability following the post-election crisis in 2010-2011, along with the implementation of significant economic reforms, has been crucial for economic growth. These reforms have aimed at improving the business environment, attracting foreign direct investment (FDI), and enhancing public sector efficiency (IMF, 2019).

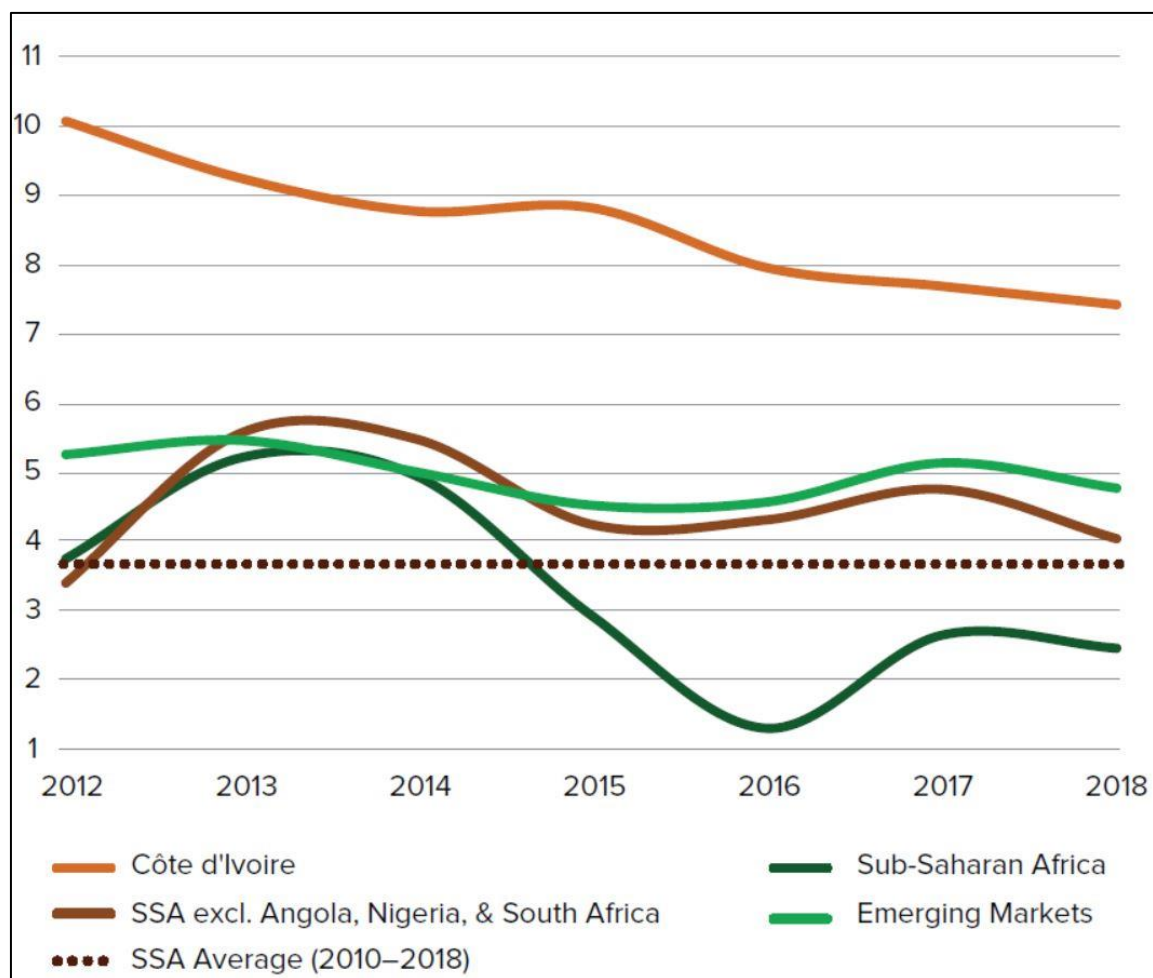


Figure 3.9. GDP growth, 2012–2018

Despite impressive growth, Côte d'Ivoire faces several challenges that could impact its economic trajectory. The economy's heavy reliance on agricultural commodities, particularly cocoa, exposes it to global price volatility, affecting revenue stability and economic planning (World Bank, 2020). Rapid economic growth has not been evenly distributed, with significant disparities in income and access to services across different regions and communities. Addressing these inequalities is crucial for sustainable and inclusive growth (UNDP, 2018). While significant progress has been made in infrastructure development, gaps in transportation, energy, and water supply infrastructure persist, potentially hindering economic activities and regional integration (ADB, 2018).

The economic context and growth of Côte d'Ivoire have direct implications for urban development and transportation. Economic growth and rural-to-urban migration have fuelled rapid urbanization, increasing the demand for urban infrastructure, including transportation, housing, and utilities. Addressing this demand is critical for sustaining economic growth and

improving living conditions (UN-Habitat, 2014). To support economic activities and enhance connectivity, there is a growing need for investment in transportation infrastructure, including roads, ports, and public transit systems. Such investments can facilitate access to markets, reduce transportation costs, and improve competitiveness (World Bank, 2020). The economic expansion offers an opportunity to adopt sustainable urban planning practices that integrate economic, social, and environmental considerations. Planning for compact, connected, and sustainable cities can enhance the quality of life, reduce environmental impacts, and support long-term economic resilience (Cervero and Kockelman, 1997).

3.7.3. Challenges in urban development

Urban development in Côte d'Ivoire faces several challenges, including inadequate infrastructure, informal settlements, and environmental concerns. As cities like Abidjan expand, the pressure on housing, sanitation, and transportation systems intensifies, necessitating comprehensive urban planning and investment (UN-Habitat, 2014). Urban development in developing countries like Côte d'Ivoire faces a myriad of challenges that can hinder sustainable growth and equitable access to urban resources. These challenges are often interlinked with economic, social, and environmental factors, requiring comprehensive strategies to address them. Addressing the challenges in urban development requires a multifaceted approach that balances economic growth with social inclusion and environmental sustainability.

Infrastructure deficits

Urban areas in developing countries often grapple with significant infrastructure deficits, including inadequate transportation networks, insufficient water supply and sanitation, and unreliable electricity services. These deficits not only affect the quality of life but also impede economic development. Inadequate transportation infrastructure leads to congestion, long travel times, and limited accessibility, particularly for residents in peripheral urban areas. This challenge is compounded by the lack of integration between different modes of transport and insufficient investment in public transit systems (Poiani and Stead, 2015). Many urban areas face challenges in providing reliable access to clean water and adequate sanitation facilities. This situation contributes to health problems and environmental pollution, affecting the most vulnerable populations (UNICEF and WHO, 2019). Access to

reliable and affordable energy remains a challenge, impacting businesses, healthcare facilities, and households. The reliance on non-renewable energy sources also raises environmental concerns (International Energy Agency, 2019).

Informal settlements

A significant portion of the urban population lives in informal settlements, characterized by limited access to basic services and infrastructure. Efforts to improve living conditions in these areas are critical for sustainable urban development. The rapid pace of urbanization, coupled with limited affordable housing, has led to the proliferation of informal settlements. These areas are characterized by overcrowded living conditions, insecure land tenure, and lack of access to basic services. The demand for affordable housing far exceeds supply, forcing many urban dwellers into informal settlements with substandard living conditions (UN-Habitat, 2016). Insecure land tenure in informal settlements discourages investment in housing improvements and infrastructure, perpetuating the cycle of poverty.

Environmental sustainability

Urban expansion has raised concerns about environmental sustainability, including pollution and deforestation. Implementing green urban development strategies is essential for preserving the country's rich biodiversity and natural resources. Urban development also poses significant environmental challenges, including pollution, waste management, and vulnerability to climate change. These challenges are exacerbated by inadequate planning and regulatory enforcement. Urban areas contribute significantly to air and water pollution, with transportation, industry, and inadequate waste management as primary sources. Pollution poses serious health risks and affects environmental quality (World Health Organization, 2018). Cities are particularly vulnerable to the impacts of climate change, including increased temperatures, sea-level rise, and extreme weather events. Urban areas need to adopt resilient infrastructure and planning practices to mitigate and adapt to these changes (Revi et al., 2014).

Addressing urban development challenges

Adopting integrated planning approaches that consider housing, transportation, environmental sustainability, and social equity can enhance the liveability and resilience of urban areas (Cervero and Kockelman, 1997). Increasing investment in critical infrastructure, including transportation, water and sanitation, and energy, is essential for supporting sustainable urban growth (United Nations, 2018). Policies aimed at formalizing informal settlements, improving housing conditions, and securing land tenure can contribute to social and economic inclusion (UN-Habitat, 2014). Implementing policies for pollution control, waste management, and climate change adaptation can improve environmental sustainability and urban resilience (IPCC, 2014).

3.7.4. Transportation infrastructure

Côte d'Ivoire's transportation infrastructure is a critical component of its economic development strategy. The country boasts a relatively well-developed road network, significant port facilities, and emerging urban transit systems, but still faces challenges in meeting the growing demand for mobility (ADB, 2018). Transportation infrastructure plays a pivotal role in shaping the economic and social fabric of cities and countries, facilitating the movement of goods and people, enhancing accessibility, and contributing to sustainable development. In developing countries, where rapid urbanization and economic growth exert pressure on existing infrastructure, the development and maintenance of transportation networks are crucial challenges.

State of transportation infrastructure

Developing countries often grapple with a range of issues related to transportation infrastructure, including inadequate road networks, limited public transit systems, underdeveloped rail and port facilities, road networks, port infrastructure, and urban transit.

Many developing countries have road networks that are insufficient in coverage and capacity, often characterized by poor road conditions. This inadequacy hampers efficient transport, increases vehicle operating costs, and contributes to congestion and higher accident rates (World Bank, 2017). Public transportation systems in many developing cities

are underdeveloped or overstretched, unable to meet the demands of growing urban populations. This results in overcrowding, long wait times, and reliance on informal transit options (Pucher et al., 2007). Rail systems, where they exist, often suffer from underinvestment, while port facilities may lack the capacity to handle current demand efficiently. These limitations constrain trade and hinder economic competitiveness (ADB, 2018).

The country has invested in expanding and rehabilitating its road network, crucial for connecting major cities and facilitating regional trade. However, maintenance and congestion in urban areas remain challenges. The Port of Abidjan is one of the largest and most important in West Africa, serving as a gateway for international trade. Expanding port facilities and improving efficiency are ongoing priorities. In Abidjan, efforts to improve urban transit include the development of a Bus Rapid Transit (BRT) system and plans for a metro rail. These initiatives aim to reduce congestion and provide efficient transportation options for residents.

The state of transportation infrastructure directly impacts various aspects of development such as economic growth, social equity, and environmental sustainability. Efficient transportation infrastructure is critical for economic growth, enabling access to markets, reducing the cost of doing business, and attracting investment (Rodrigue, 2020). Inequities in transportation infrastructure can exacerbate social inequalities, limiting access to employment, education, and healthcare for disadvantaged populations (Lucas, 2012). Inadequate or inefficient transportation infrastructure contributes to environmental degradation through increased emissions, pollution, and encroachment on natural habitats (Sperling and Cannon, 2004).

Strategies for improvement

Improving transportation infrastructure in developing countries is critical for supporting economic development, enhancing social equity, and promoting environmental sustainability. By adopting comprehensive strategies that prioritize investment, integrated planning, sustainable modes of transport, and technological innovation, these countries can overcome existing challenges and build more resilient and efficient transportation systems.

Addressing the challenges associated with transportation infrastructure in developing countries requires a multifaceted approach.

Mobilizing financial resources for infrastructure development and maintenance is essential. This may involve leveraging public-private partnerships, international financing, and innovative funding mechanisms (Estache and Iimi, 2011). Adopting an integrated approach to transportation planning that considers land use, urban development, and environmental impacts can enhance the efficiency and sustainability of transportation systems (Cervero and Kockelman, 1997). Encouraging the development and use of sustainable transportation modes, such as mass transit, cycling, and walking, can address congestion, reduce environmental impacts, and improve urban liveability (Litman, 2015). Leveraging technology and innovation, including intelligent transportation systems (ITS) and green vehicles, can improve the efficiency and environmental performance of transportation systems (Pucher et al., 2007). Strengthening the capacity of institutions responsible for transportation planning, implementation, and maintenance is crucial for ensuring the effective delivery of infrastructure projects (World Bank, 2017).

3.8. Abidjan: A Contextual Analysis

Abidjan, the economic capital of Côte d'Ivoire, stands as a vibrant metropolis that embodies the complexities and dynamism of urban development in Sub-Saharan Africa. As a focal point for economic activities, migration, and cultural exchange, Abidjan faces unique challenges and opportunities in its urbanization and transportation infrastructure. Abidjan's context illustrates the multifaceted challenges and opportunities inherent in urban development within Sub-Saharan Africa.

3.8.1. Demographic profile

Abidjan is one of the most populous cities in West Africa, with a diverse and rapidly growing population. This growth is fuelled by both natural increase and rural-urban migration, driven by individuals seeking better economic opportunities and living conditions. The city's demographic expansion puts pressure on housing, services, and infrastructure, necessitating innovative urban planning and development strategies (United Nations, Department of Economic and Social Affairs, 2019).

As the largest city and economic capital of Côte d'Ivoire, Abidjan is located on Ébrié Lagoon on the Gulf of Guinea (Atlantic Ocean). As one of the largest cities in Africa, Abidjan has 6.3 million inhabitants in an area of 629 km², representing 21.5% of the country's population.

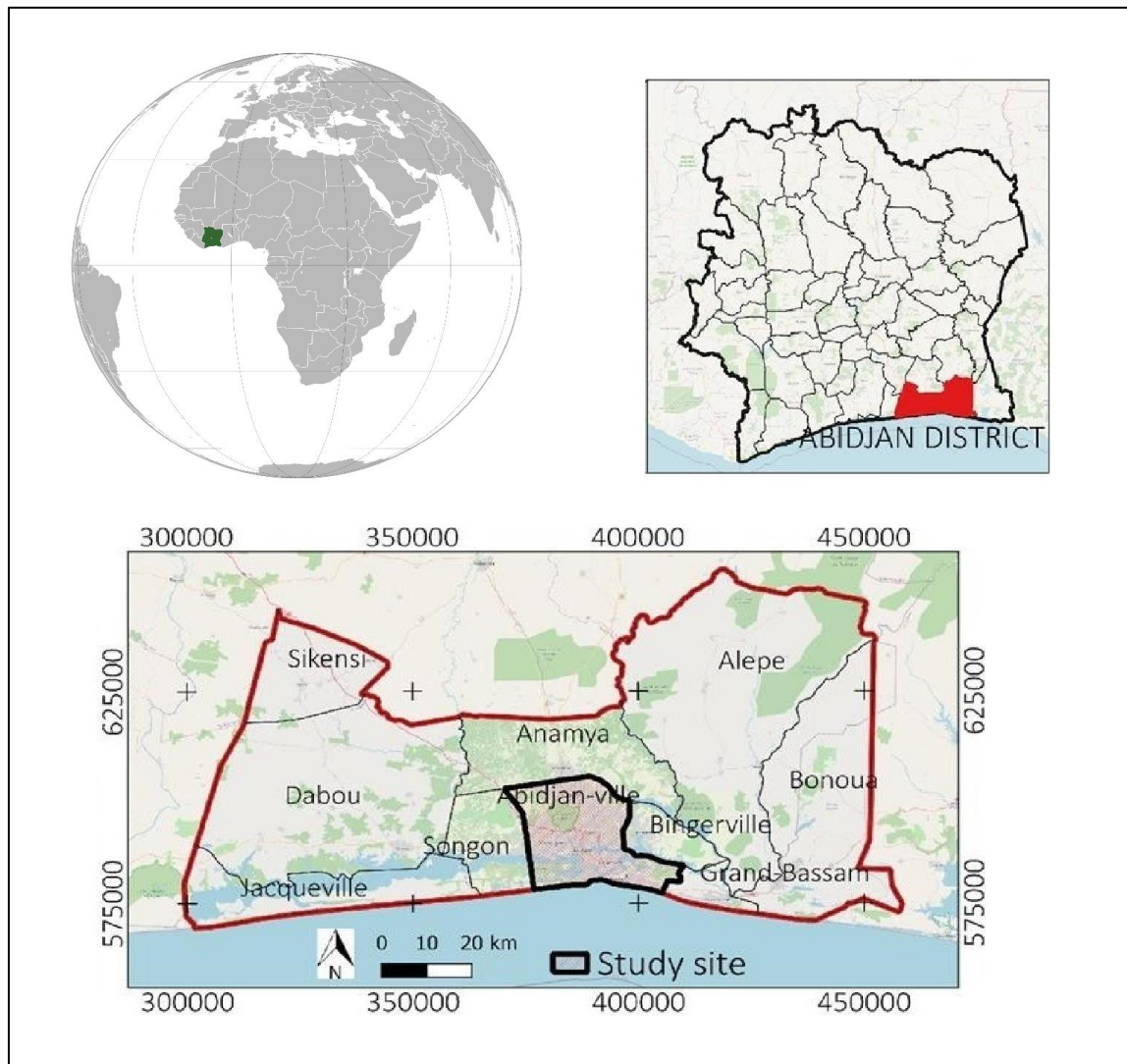


Figure 3.10. Map of Abidjan District

As the economic heartbeat of Côte d'Ivoire, Abidjan exhibits a dynamic and complex demographic profile shaped by rapid urbanization, migration, and a youthful population. Understanding these demographic trends is crucial for addressing urban development challenges, particularly in planning for housing, services, and transportation infrastructure. Abidjan's demographic profile is characterized by rapid growth, migration, a youthful population, and diversity, presenting both challenges and opportunities for urban development.

Rapid population growth and migration

Abidjan's population has seen a rapid increase over the past few decades, making it one of the largest cities in West Africa. This growth is driven by both natural population increase and significant rural-to-urban migration, as people move to the city seeking better economic opportunities and living conditions. The United Nations Department of Economic and Social Affairs (2019) highlights the urbanization trend across Sub-Saharan Africa, with cities like Abidjan experiencing some of the fastest growth rates.

By 2050, Abidjan will be home to over 10 million people according to World Bank projections.

Abidjan is the largest city in the nation, with around one-fourth of the total population of the nation, and produces about 80% of the formal economy's intra-regional output. It is also one of the most populous cities in Africa, besides Lagos, Cairo, Kinshasa, and others.

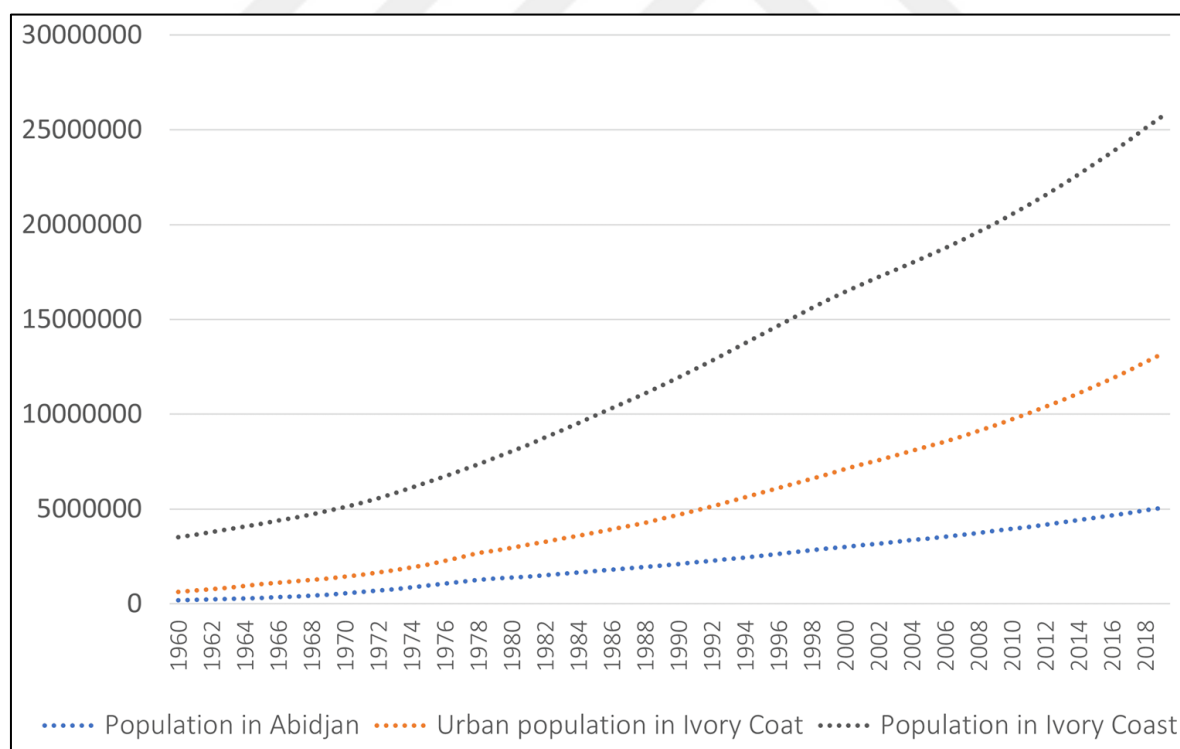


Figure 3.11. Population growth 1960 -2019

The influx of migrants from rural areas and other regions has contributed to the city's diversity but also to its challenges, including the proliferation of informal settlements. Rural-

to-urban migration is fuelled by the perceived economic opportunities in the city compared to subsistence agriculture in rural areas (Tacoli, 2012). This migration pattern underscores the need for comprehensive urban planning that accommodates the growing population and mitigates the strain on infrastructure and services.

Abidjan's demographic profile is characterized by a significant proportion of young people, which presents both opportunities and challenges for the city's development. A youthful population can be a vibrant workforce driving economic growth, yet it also necessitates substantial investments in education, healthcare, and job creation to harness this potential effectively. The World Bank (2020) emphasizes the importance of policies and programs that support youth employment and education as critical for sustainable development.

The city's demographic diversity, with people from various ethnic, cultural, and national backgrounds, enriches Abidjan's social fabric but also poses challenges to social cohesion and inclusive urban governance. Ensuring equitable access to opportunities and services for all residents, regardless of their background, is essential for fostering social inclusion and stability.

The demographic trends in Abidjan have direct implications for urban planning, particularly in transportation, housing, and social services. The growing and increasingly mobile population necessitates the development of efficient and accessible transportation systems that can accommodate the rising demand for mobility within the city. Addressing the housing needs of a rapidly expanding population, especially the challenge of informal settlements, requires innovative housing policies and the expansion of basic urban services. Urban planning must also consider the needs of the city's youthful population, including the provision of educational facilities, recreation areas, and employment opportunities.

3.8.2. Economic and social landscape

The city serves as the economic engine of Côte d'Ivoire, hosting a significant portion of the nation's industrial and service sectors. It is a critical hub for both national and international trade, with the Port of Abidjan playing a key role in the regional economy. Despite its economic vibrancy, Abidjan grapples with social disparities, with notable differences in

wealth, access to services, and living conditions across different neighborhoods (World Bank, 2020).

In Abidjan, three economic sectors play a crucial role: formal, informal, and limited agriculture due to urban constraints (Semboloni, 1999). The formal sector consists of modern, capital-intensive activities primarily carried out by companies and the public administration, with medium-level wages for employees. Informal activities are labor-intensive and performed by small firms, where workers often have autonomy and earn low-level wages. The traditional informal sector is characterized by minimal capital input and limited size. Small businesses exhibit hybrid characteristics, growing in size and capital while competing with the formal sector in labor-intensive production.

Nonetheless, even if the link between urbanization and economic development is real, it does not occur automatically. Poverty grew (+7 points) in Abidjan between 2008 and 2014, but it decreased (-6 points) in rural regions. The rise in urban vulnerability has resulted in a housing crisis, oversaturation of social assistance programs, and increased insecurity. In conclusion, while living circumstances in Abidjan are generally better than in rural regions, they appear to be rapidly deteriorating (Morisset, 2019).

Abidjan serves as the economic hub and capital of Côte d'Ivoire, housing the country's main financial, commercial, and administrative institutions. The city's economic significance has attracted a large influx of people from rural areas and neighboring countries in search of employment and economic opportunities. The economic growth and urbanization processes in Abidjan have placed significant pressure on the transportation system to support the increasing population and economic activities.

Abidjan, as the economic capital of Côte d'Ivoire, boasts a vibrant and diverse economic and social landscape. The city's role as a hub for commerce, industry, and finance in West Africa underpins its dynamic growth but also presents challenges in terms of inequality and access to services. Abidjan's economic and social landscape presents a complex mosaic of opportunities and challenges.

Economic dynamism, social disparities and employment

Abidjan's economy is characterized by a mix of modern sectors, including finance, telecommunications, and services, alongside traditional industries such as agriculture, manufacturing, and trade. The Port of Abidjan, one of the largest in West Africa, plays a pivotal role in the city's and the country's economic activity, serving as a crucial node for international trade and regional connectivity (World Bank, 2020). The city's strategic location and its role as a financial center attract both domestic and foreign investment, driving economic growth.

Despite its economic vibrancy, Abidjan faces significant social disparities. The wealth generated in the city is unevenly distributed, leading to pronounced inequalities in income, access to services, and living conditions. Informal settlements house a considerable portion of the population, where residents often lack access to adequate housing, clean water, sanitation, and reliable electricity (UN-Habitat, 2014). Addressing these disparities is critical for fostering inclusive growth and improving the quality of life for all Abidjan residents.

The informal sector plays a significant role in Abidjan's economy, providing livelihoods for a large segment of the population. While this sector offers flexibility and opportunities for entrepreneurship, it also reflects the challenges of job insecurity, lack of social protections, and low productivity. Efforts to formalize informal activities and create sustainable employment opportunities are essential for economic development and social inclusion (ADB, 2018).

Urban development and transportation infrastructure

Rapid urbanization and economic growth have placed considerable pressure on Abidjan's urban services and infrastructure. The city struggles with traffic congestion, inadequate waste management, and periodic flooding, which are exacerbated by insufficient urban planning and investment in infrastructure. Enhancing the capacity and resilience of urban services and infrastructure is vital for supporting the city's continued growth and improving residents' well-being (Poiani and Stead, 2015).

The economic and social landscape of Abidjan has direct implications for urban development and transportation planning such as economic diversification and sustainability, social equity and inclusion, and investment in transportation infrastructure: integrated urban planning.

Promoting economic diversification and sustainability can reduce reliance on volatile sectors and create a more resilient urban economy. This includes supporting the growth of green industries and enhancing the productivity of the informal sector. Addressing social disparities through inclusive urban policies and targeted investments in underserved areas can improve access to opportunities and services for all residents, contributing to social cohesion and stability.

Developing efficient and accessible transportation systems is critical for supporting economic activity, reducing congestion, and enhancing mobility, particularly for those in informal settlements and peripheral areas. Adopting integrated approaches to urban planning that consider the interconnections between land use, transportation, housing, and economic development can foster a more sustainable and inclusive urban environment.

3.8.3. Urbanization and transport infrastructure

Abidjan, reflecting broader trends in Sub-Saharan Africa, is experiencing rapid urbanization that has significant implications for its transport infrastructure. The city's growth presents both challenges and opportunities for developing efficient, equitable, and sustainable transportation systems. As the cultural and economic hub of West Africa, Abidjan is distinguished by high levels of industrialization and urbanization.

Abidjan's urban landscape is marked by rapid expansion, which presents both challenges and opportunities for sustainable development. The city's urbanization is characterized by sprawl into surrounding areas, straining existing transportation infrastructure and leading to congestion and mobility issues. Efforts to upgrade and expand transport networks are crucial for accommodating growing demands and facilitating efficient urban mobility (ADB, 2018).

Urbanization trends

Abidjan's urbanization is characterized by rapid population growth and spatial expansion. The migration from rural areas, driven by the search for better economic opportunities and living conditions, has contributed to this growth. Abidjan's urbanization and its impact on transport infrastructure reflect the complexities of managing growth in a rapidly developing urban context. However, the urban sprawl extends beyond the capacity of existing infrastructure and services, leading to congestion and the proliferation of informal settlements (UN-Habitat, 2014).

Abidjan is also a starting point for the transportation network of roads, airports, and railways that connect it to other cities in neighborhood countries. The Autonomous Port of Abidjan (PAA), the largest port in the ECOWAS region as of 2018 (according to the PAA Activity Report), serves as a gateway for landlocked nations like Mali and Burkina Faso and plays a significant role in the Lagos-Abidjan corridor, which connects to Togo, Benin, Ghana, Nigeria and other coastal African countries (MCLU and JICA, 2020). According to data obtained from Ramiaramananana et al. (2021), Abidjan City is facing several problems such as unemployment 19%, poverty 13%, health 9%, transportation 5% and housing 4%, etc. As a rapidly growing urban center, Abidjan is characterized by a complex transportation system.

The city's urban form, with extensive residential areas developing on the periphery, places additional demands on the transportation network to connect these areas with economic centers. These challenges require a multifaceted approach that encompasses the expansion and modernization of public transit, promotion of sustainable transportation modes, integration of informal transportation services, and comprehensive urban planning. Through these strategies, Abidjan can develop a more efficient, equitable, and sustainable transportation system that supports the city's continued growth and improves the quality of life for its residents.

Impacts and challenges for transport infrastructure

As the primary mode of transportation in Abidjan is road-based, the city faces significant traffic congestion, particularly during peak hours. Congestion not only affects commuting times but also contributes to increased pollution and reduced productivity (Pojani and Stead,

2015). The public transportation system in Abidjan struggles to meet the demands of the growing population. Limited coverage, capacity, and reliability of existing public transit options, including buses and shared taxis, hinder the mobility of urban residents, especially those from lower-income groups (Cervero and Golub, 2007). In response to gaps in formal public transportation, informal transport services have flourished. While they provide essential mobility options, issues related to safety, regulation, and integration with the formal transportation system remain (Salazar Ferro et al., 2015).

According to Ramiaramananana et al. (2021), Abidjan City is facing several problems such as unemployment 19%, poverty 13%, health 9%, transportation 5% and housing 4%, etc. A World Bank report (2018) stated that more than 10 million trips are made in the city. Domestic traveling costs are among the highest in the world. Less than 1% of trips are made via public transport (Berrou et al., 2017). Transport policies adopted by the city do not consider the needs of the lower and middle classes because most transport projects are geared towards the upper classes. The cost of daily trips made in the city accounts for more than 30% of the income of poor families (Berrou et al., 2017). Private modes of transport i.e. Gbaka, meter taxis, Worro-Worro, and inter-communal taxis account for 85% of trips (Berrou et al., 2017).



Figure 3.12. Public transport modes in Abidjan

These operators pose a high risk to safety, pollution, and congestion. The most popular modes of transportation in the city are informal (Gbaka “minibusses” and Woro-woro “informal taxis”) and private cars. People also travel by walking or bicycle for short trips. While public transit and motorcycles are negligible (Johnstone and Ratanavaraha, 2020). Motorcycles are not a common mode of transportation in Abidjan compared to other cities (Doumbia et al., 2021).

Efforts to promote sustainable transportation modes, including non-motorized transport (cycling and walking) and the use of cleaner vehicles, are crucial for reducing congestion and environmental impact. This includes investing in cycling infrastructure and pedestrian-friendly urban design (Litman, 2015). Initiatives to expand and modernize public transit, such as the development of a Bus Rapid Transit (BRT) system and plans for a metro rail, are underway. These projects aim to increase the capacity, reliability, and coverage of public transportation in Abidjan (ADB, 2018).

Formalizing and integrating informal transportation services into the broader urban transportation strategy can enhance service quality and safety. Policies to regulate and support informal operators can improve the overall efficiency of the transportation system (Behrens et al., 2016). Adopting comprehensive urban planning approaches that integrate land use and transportation planning can address the challenges of urban sprawl. Planning for higher-density, mixed-use developments around transportation hubs can reduce the reliance on personal vehicles and foster more sustainable urban growth (Cervero and Kockelman, 1997).

3.9. Transportation Modes in Abidjan

Abidjan, known for its vibrant culture and economic significance in West Africa, boasts a variety of private transportation modes. The city's transportation landscape is diverse, with several formal and informal transport options catering to the needs of its residents and visitors.

A report published by the World Bank (2018) stated that more than 10 million trips are made to this city. The domestic cost of traveling is amongst the highest in the world. Less than 1% of trips are only made via public transport (Berrou, 2018). Transportation policies adopted

by the city do not consider the needs of the middle class because most of the transport projects are inclined toward the upper class. The cost of daily trips made in the city accounts for more than 30% of the income of poor families (Berrou, 2018). The private modes of transport i.e. woro-woro, meter taxis, inter-communal taxis, and gbaka account for 85% of trips (Berrou, 2018). These operators pose a higher risk of safety, pollution, and congestion. (Doumbia et al., 2021). These include gbakas (mini-buses), meter taxis, woro-woros (shared taxis), and inter-communal taxis, each offering different services, costs, and experiences to commuters.

3.9.1. Gbaka (Mini-buses)

Gbaka minibusses are a popular and affordable mode of transport. They operate on fixed routes without formal stops, allowing passengers to hop on and off at convenient locations. Gbakas are easily recognizable by their multicolors and graffiti; and are known for their lively atmosphere. However, they can be crowded and may not always follow strict safety standards.



Figure 3.13. Gbaka minibuses

Capacity: Typically, 15-30 passengers. Cost: Relatively low, making them accessible to the general population. Routes: Cover extensive areas of the city and suburbs.

3.9.2. Meter taxis

Meter Taxis offer a more private and comfortable means of transportation. They are equipped with meters, ensuring fares are calculated based on distance traveled, although it's not uncommon for drivers to negotiate flat rates for longer journeys.



Figure 3.14. Meter taxis

Privacy: Ideal for individuals or small groups seeking a private ride. Safety: Generally safer and more reliable than other modes. Cost: Higher than gbakas or woro-woros but offers comfort and convenience.

3.9.3. Woro-woro (Shared taxis)

Woro-Woro is shared taxis identifiable by their color, offering a compromise between cost and convenience. They follow fixed routes but are more flexible than gbakas, stopping at any requested point along their route.



Figure 3.15. Woro-woro

Capacity: Typically carries fewer passengers than gbakas, 4-7 passengers. Cost: Moderately priced, cheaper than private taxis but slightly higher than gbakas. Routes: More defined than gbakas, often connecting specific communes or zones. Types: The yellow color wôrô-wôrô are from the commune of Cocody The beige color with two brown bands wôrô-wôrô is from Abobo. The blue color wôrô-wôrô are from the commune of Yopougon. The yellow colour with blue band wôrô-wôrô are from Port-Bouët, Vridi

The green colour wôrô-wôrô are from the communes of Marcory, Koumassi and Adjamé.

3.9.4. Inter-communal taxis

Inter-communal Taxis are designed to facilitate travel between different communes or suburbs of Abidjan. They are commonly confused with woro-woro because of their obsolescence and color. They can be private or shared, depending on the passenger's preference, and provide a vital link for commuters working or living in different parts of the city.



Figure 3.16. Inter-communal taxis

Flexibility: Offers options for both private hire and shared rides. Coverage: Extensive, including areas not served by other modes. Cost: Varies based on distance, sharing, and negotiation with the driver.

3.9.5. SOTRA buses

Société des Transports Abidjanais (SOTRA) is the public transport company operating bus services in Abidjan. SOTRA buses are an essential part of the city's public transportation network, providing regular and reliable services across various routes.



Figure 3.17. SOTRA buses

Coverage: SOTRA buses serve a wide range of routes, connecting major districts, suburbs, and points of interest within Abidjan and its surrounding areas. Cost: The fares are affordable, and designed to be accessible to the general public. Pricing varies based on the distance and specific route. Features: These buses are known for their relatively higher standard of comfort and safety compared to informal transport options. They operate on fixed schedules, providing a dependable mode of transport for daily commuters.

3.9.6. VTC (Vehicle for hire)

VTC (Voiture de Transport avec Chauffeur), which translates to "Vehicle for Hire with Driver," is a modern, app-based private transportation service similar to what is internationally known as ride-hailing or ride-sharing services. In the context of Abidjan, VTC services have grown in popularity, offering an alternative to traditional taxis and other forms of public and private transportation. Here's an overview of VTC services and their impact on urban mobility in Abidjan.

VTC services in Abidjan operate through smartphone apps, where users can book rides from private drivers. This technology-driven approach provides convenience, transparency, and efficiency in booking rides. VTCs are known for their high service standards, including clean

vehicles, courteous drivers, and the convenience of cashless transactions. The customer experience is further enhanced by features such as fare estimates, route tracking, and driver ratings. The service is accessible to anyone with a smartphone and internet access, making it a popular choice for tech-savvy individuals and those seeking reliable and comfortable transportation options. VTC services have become an integral part of the urban transportation landscape in Abidjan, offering a blend of technology, convenience, and quality that appeals to a wide range of users. As the city continues to grow and evolve, the role of VTCs in shaping sustainable and efficient urban mobility will likely expand, alongside ongoing efforts to integrate them effectively within the broader transportation ecosystem.



Figure 3.18. VTC (Vehicle for hire)

Convenience and Safety: VTC apps offer real-time information on driver location, estimated arrival times, and fare calculations, providing a level of convenience and safety not always available in traditional taxis. **Flexible Payment Options:** With VTCs, passengers can choose from various payment methods, including credit/debit cards, mobile money, or even cash in some cases, enhancing the flexibility and accessibility of the service. **Quality and Reliability:** VTC companies often have strict standards for driver recruitment and vehicle quality, ensuring a consistently positive experience for users.

Regulatory Framework: The rapid growth of VTC services can sometimes outpace the existing regulatory framework, leading to conflicts with traditional taxi services and regulatory challenges regarding licensing, safety, and taxation. **Market Competition:** The entry of VTCs into the transportation market in Abidjan has introduced competition, impacting the livelihoods of traditional taxi drivers and prompting discussions about fair competition and market regulation. **Digital Divide:** While VTCs offer numerous advantages,

they also highlight the digital divide, as those without access to smartphones or the internet may find themselves with fewer transportation options.

3.9.7. Water buses

Water buses are passenger boats designed for public transport in Abidjan. They operate on fixed routes and schedules, similar to traditional buses, but navigate through waterways. In a city with a lagoon and coastal areas like Abidjan, water buses can significantly ease traffic congestion on roads. Given Abidjan's geographical setting, water buses enhance its public transport system, especially for crossing the Ébrié Lagoon or connecting waterfront communities. Water buses are lauded for being more environmentally friendly than road-based vehicles, especially if they employ clean energy sources. They offer a more relaxed and scenic commute compared to the hustle and bustle of road traffic.

By offering an alternative to road transport, water buses could help alleviate congestion in densely populated areas. Besides serving commuters, water buses could also appeal to tourists, offering scenic routes across the lagoon. They better integrate isolated communities or those separated by water, improving access to essential services and economic opportunities.



Figure 3.19. Water buses

Infrastructure Investment: Establishing water bus services requires significant upfront investment in docking stations, vessels, and safety measures. **Environmental Concerns:** While potentially cleaner than road transport, the environmental impact of water buses depends on the type of fuel used and the management of the waterways. **Regulatory Framework:** Implementing water buses involves navigating regulatory requirements, ensuring safety standards, and coordinating with existing waterway uses.

3.9.8. Pinasses (Water taxis)

Pinasses are a unique and vital component of Abidjan's transportation system, functioning as water taxis. These boats facilitate travel across the lagoon that divides parts of the city, offering an alternative to road transport, which can be congested.



Figure 3.20. Pinasses (Water taxis)

Routes: Pinasses operate across various points along the lagoon, connecting areas that might otherwise require significant detours via road transport. **Capacity:** Varies, with some pinasses accommodating large groups of passengers, while others are smaller and more suited for private hire. **Cost:** Fares are generally reasonable, offering a cost-effective alternative for crossing the lagoon. Prices depend on the distance and the specific docking points used. **Experience:** Traveling by pinasse provides not only a practical means of transport but also a scenic view of Abidjan from the lagoon, making it a preferred choice for many, especially during peak traffic hours.

3.9.9. Taxis motos or taxi-tricycles “saloni”

Tricycles “Saloni” used as a transport mode have been a new phenomenon in Abidjan since 2019. This mode of transport has never been authorized to operate within the city. Motorcycles are not a common mode in the Abidjan area as compared to other cities (Doumbia et al., 2021). However, this new type of popular transport has taken root on the outskirts of the city. They are used for their ability to navigate through traffic more swiftly than four-wheeled vehicles. They are especially popular for short to medium distances within

the city suburb zones. One of the key advantages of saloni is its high availability. They can be found throughout the suburban zones of the city, including in villages close to Abidjan, near markets. Taxis motos can navigate through non-paved roads to destinations that might be inaccessible to larger vehicles, dropping passengers off exactly where they need to go.



Figure 3.21. Taxi-tricycles “saloni”

Cost: Taxis motos are generally more affordable than car taxis for similar distances. This cost-effectiveness, combined with the speed of travel, makes them a favored option for many residents. They are a more economical option for individuals or those traveling light.

Flexibility: Riders can negotiate the fare directly with the driver before starting their journey, providing a degree of flexibility in pricing. **Speed:** Their size allows them to move through traffic more easily, significantly reducing travel times during peak hours. **Safety Concerns:** The safety of motorcycle taxis can be a concern. The lack of formal safety measures such as helmets for passengers or strict adherence to traffic laws raises risks. **Weather Dependency:** Taxis motos are less practical in bad weather conditions, such as heavy rain, which can limit their availability and comfort. **Regulation and Formalization:** In many areas, taxi motos operate in a largely informal sector, which can lead to inconsistencies in service quality and fare dispute.

3.9.10. The metro d'abidjan (Abidjan metro)

The Metro d'Abidjan is a planned urban rail system designed to serve the Greater Abidjan Area, connecting key residential, commercial, and industrial zones across the city. Starting in 2023, the metro is due to enter service in 2028. It will connect the north and south of the city, from Anyama in the north to the airport in the south, passing through the districts of Abobo, Adjamé, Treichville, and Port- Bouët as well as the Plateau (administrative and economic center). The metro represents a pivotal infrastructure project in the urban and economic development of Abidjan. It aims to significantly enhance public transportation, reduce traffic congestion, and contribute to the sustainable growth of the city.



Figure 3.22. Construction of metro abidjan

From the start, network traffic is expected to be 500,000 passengers per day, transported by around 20 trains which will run every 5 to 10 minutes during peak hours. The project is planned in multiple phases, with the initial lines connecting densely populated and economically vital areas of Abidjan. The first section of 37.5 km will connect Anyama in the north to Port-Bouët to the south of Abidjan in 50 minutes, stopping at 18 stations. The project involves collaboration between the Ivorian government and international partners, including financial institutions and foreign governments, ensuring access to necessary expertise and funding.



Figure 3.23. Route and stations of the Abidjan metro

The project reflects a substantial investment in the city's public transportation infrastructure, intending to offer an efficient, reliable, and environmentally friendly alternative to road transport. The metro will provide a high-capacity mode of transportation, alleviating the pressure on road networks and significantly reducing travel times for commuters. By improving connectivity, the metro is expected to stimulate economic activity, attract investment, and create job opportunities. As a cleaner mode of transport, the Metro d'Abidjan aligns with broader environmental goals, helping to reduce carbon emissions and pollution in the city.

3.9.11. Abidjan BRT project

As cities around the world have successfully implemented BRT systems, Abidjan, the economic capital of Côte d'Ivoire, has also embarked on developing its own BRT system to address its urban transport needs. This initiative reflects a broader trend towards embracing mass transit solutions that can provide reliable, high-capacity transportation services, particularly in rapidly urbanizing regions such as SSA.

Abidjan's decision to implement a BRT system stems from its ongoing struggles with traffic congestion, pollution, and the need for reliable public transportation options. The city's rapid population growth and economic expansion have outpaced the development of its

transportation infrastructure, leading to increased reliance on personal vehicles and informal transport modes. The BRT system is envisioned to transform Abidjan's urban mobility landscape by offering a sustainable alternative to car travel, reducing congestion on key arterial roads, and connecting major residential, commercial, and industrial areas efficiently.

Twenty (20) kilometers long, the BRT project consists of a fast lane dedicated to buses in the urban area linking Yopougon to Bingerville. This BRT crosses the municipalities of Attécoubé, Adjamé, Plateau, and Cocody. The development of a BRT system in Abidjan represents a forward-looking approach to addressing the city's transportation challenges. By providing a high-quality, efficient, and sustainable alternative to private vehicle use, the BRT system will play a crucial role in enhancing urban mobility, improving environmental conditions, and supporting economic growth in Côte d'Ivoire's largest city.

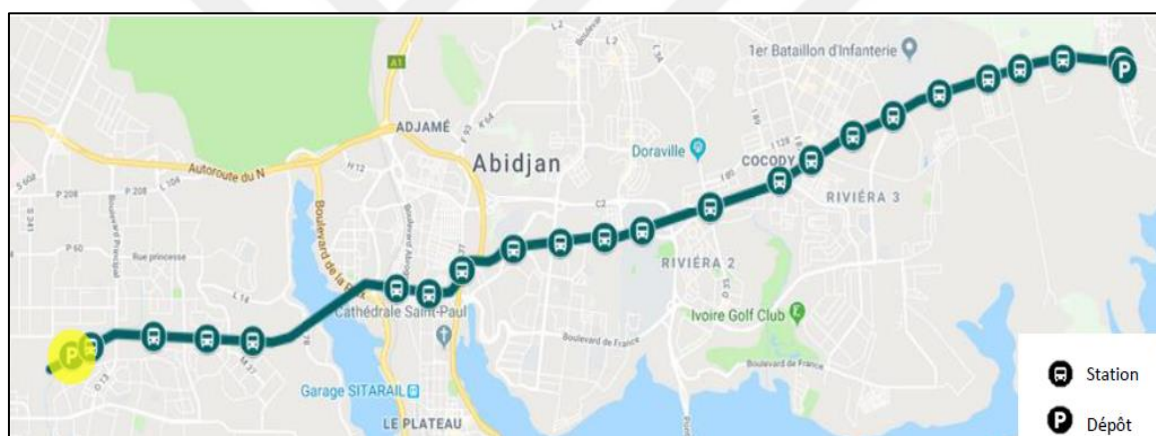


Figure 3.24. Route and location of Abidjan BRT stations

Implementing a BRT system in Abidjan involves addressing several challenges:

- **Infrastructure Development:** Constructing dedicated bus lanes and high-quality stations in a densely built urban environment requires careful planning and significant investment.
- **Integration with Existing Transport Modes:** The BRT system must be seamlessly integrated with other forms of public transport, such as minibuses (gbakas) and the forthcoming metro, to provide a comprehensive and coordinated urban mobility solution.
- **Public Acceptance:** Encouraging residents to shift from personal vehicle use to public transport requires ensuring the reliability, safety, and comfort of the BRT service.

Strategies to overcome these challenges include engaging with stakeholders during the planning and implementation phases, adopting best practices from successful BRT systems worldwide, and deploying a robust public information campaign to build support for the project.

3.10. Population Distribution and Opportunity Access

Abidjan's rapid urbanization and economic development have led to varied population distribution patterns, significantly affecting access to opportunities such as employment, education, healthcare, and other essential services. The spatial layout of the city, combined with socioeconomic factors, creates disparities in access that have profound implications for social equity and urban sustainability. According to the UN-Habitat (2014), areas with higher population densities, particularly informal settlements, often face challenges in accessing opportunities due to inadequate transportation infrastructure. Improving connectivity through comprehensive transportation planning is essential for enhancing social inclusion and economic development.

3.10.1. Population distribution patterns

Abidjan is characterized by diverse population distribution, with high-density residential areas, including both formal neighborhoods and informal settlements, alongside more sparsely populated suburban areas. The concentration of economic activities and services in certain parts of the city, particularly the central and coastal regions, contrasts with peripheral areas where infrastructure and services are less developed (UN-Habitat, 2014). Abidjan's population distribution and the resulting disparities in access to opportunities present significant challenges for urban development and social equity. A multifaceted approach is required to integrate urban planning, transportation infrastructure development, inclusive policies, and technological solutions leading the city toward a more equitable and sustainable urban future, where access to opportunities is enhanced for all residents.

3.10.2. Challenges in access to opportunities

Socioeconomic status significantly influences access to opportunities in Abidjan. Residents of informal settlements and low-income neighborhoods often face barriers to accessing

quality education, healthcare, and formal employment opportunities, exacerbating existing inequalities (World Bank, 2020). The availability and quality of transportation infrastructure directly impact access to opportunities. Inadequate public transit options and reliance on informal transportation services can limit mobility for many residents, particularly those in peripheral or underserved areas (Cervero and Golub, 2007). The spatial mismatch between residential areas and locations of employment, education, and healthcare facilities poses significant challenges. This mismatch requires residents to travel longer distances, often in the absence of efficient transportation options, to access services and opportunities (Pojani and Stead, 2015).

The distribution of population and economic opportunities in Abidjan is uneven, with disparities between different urban areas. The central business district and affluent neighborhoods tend to have better access to transportation facilities and opportunities, while marginalized communities on the outskirts face transportation challenges and limited access to essential services.

In terms of employment, most opportunities are located in central districts such as Plateau and Cocody; leading to high disparity in job distribution across the city. Addressing these disparities requires a comprehensive approach that focuses on improving transportation infrastructure, enhancing connectivity, and promoting inclusive urban development. Transport is a major social exclusion issue that revolves around accessibility and affordability. Poor road transport results in social exclusion as it prevents individuals from participating in education, work, health, and events (Church et al., 2000).

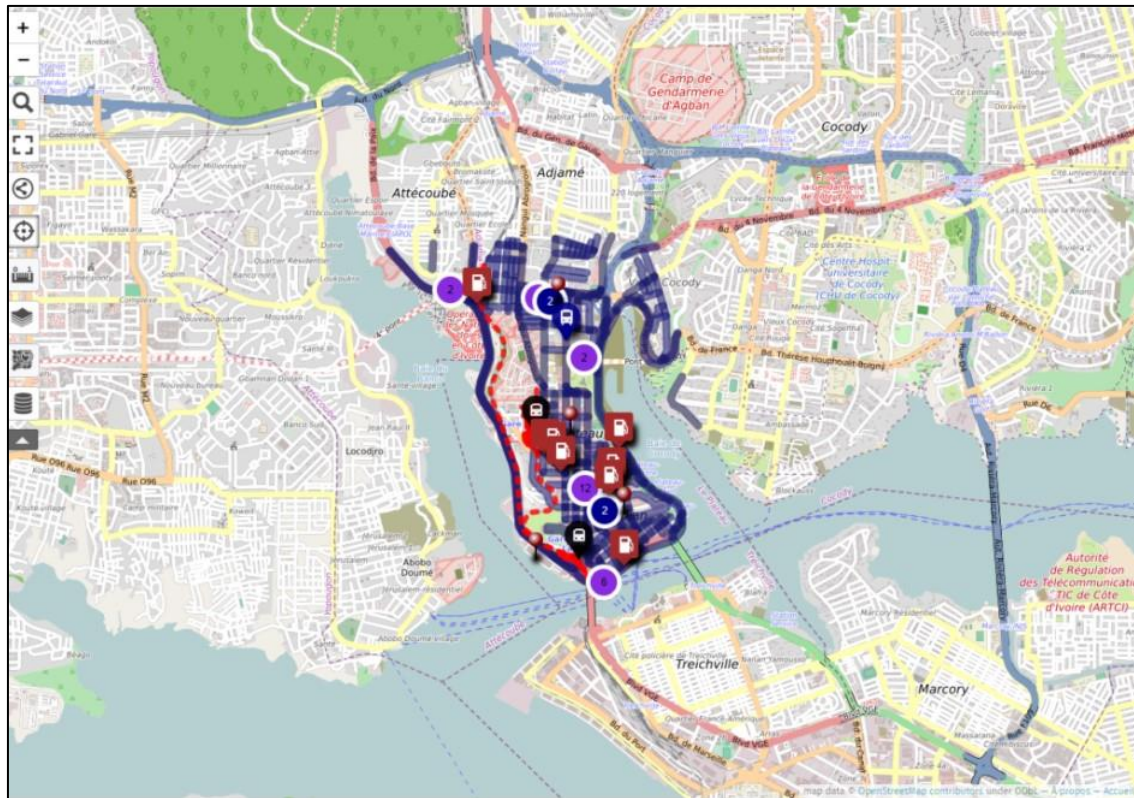


Figure 3.25. Interactive map of Abidjan following the paths of different bus and train lines

Despite the introduction of major transportation services, there still exists growing evidence of unequal accessibility and mobility in these areas (Jaramillo et al., 2012). The figure below shows an interactive map of Abidjan following different bus and train lines. A click on the map will allow navigation across the city to see the gap between districts in terms of transport network accessibility. The map provides information on the available public transport services, stops, lines, and connections. It enables a better understanding of the current public transport network and its limitations; and helps to prevent potential infrastructure and transport planning decisions to ensure equitable access to public transport services. As seen, the administrative district Plateau is well deserved contrary to other districts.

3.10.3. Enhance opportunity access

Adopting an integrated approach to urban and transportation planning can help address spatial mismatches and improve access to opportunities. This includes developing mixed-use neighborhoods and enhancing public transit connectivity to link residential areas with economic centers and services (Cervero and Kockelman, 1997). Expanding and modernizing public transit systems is crucial for improving mobility and access. Initiatives such as the

development of Bus Rapid Transit (BRT) systems and metro lines, as well as enhancing the safety and reliability of informal transit services, can significantly improve accessibility (ADB, 2018). Implementing policies that promote social and economic inclusion can help reduce disparities in access to opportunities. This includes affordable housing programs, investments in education and healthcare infrastructure in underserved areas, and support for small and medium enterprises to stimulate local economic development (UN-Habitat, 2014). Utilizing technology and innovation can improve service delivery and access to opportunities. Digital platforms for education and healthcare services, mobile banking, and transportation apps can enhance accessibility, particularly for residents in remote or underserved areas (World Bank, 2020).

3.11. Transportation Challenges in Abidjan

Abidjan, like many rapidly growing cities in developing countries, faces significant transportation challenges that impact its economic development, environmental sustainability, and residents' quality of life. These challenges stem from urbanization pressures, infrastructure deficits, and the need for sustainable mobility solutions. The transportation challenges in Abidjan require a comprehensive and multi-faceted approach that prioritizes sustainable, efficient, and inclusive mobility solutions. Through targeted investments, policy reforms, and the promotion of sustainable transportation options, Abidjan can overcome these challenges and move towards a more sustainable and equitable transportation future.

Transportation in Abidjan is characterized by a reliance on road-based systems, including a mix of formal and informal services. Challenges include traffic congestion, inadequate public transportation options, and the need for infrastructure maintenance and expansion. The city is exploring solutions such as the development of a Bus Rapid Transit (BRT) system and the expansion of road networks to improve mobility and reduce reliance on personal vehicles (Pojani and Stead, 2015).

One of the most pressing transportation issues in Abidjan is traffic congestion. The city's road network is often overwhelmed by the volume of vehicles, leading to significant delays, especially during peak hours. Congestion is exacerbated by inadequate road maintenance, limited alternative routes, and a lack of efficient public transportation options. The economic

cost of congestion, including lost productivity and increased fuel consumption, is substantial (Pojani and Stead, 2015).

Abidjan's public transportation system struggles to meet the demands of its growing population. The existing infrastructure, comprising buses and informal minibuses (gbakas), is often insufficient, unreliable, and overcrowded. The lack of comprehensive coverage means that many areas, particularly informal settlements, and peripheral neighborhoods, are underserved, forcing residents to rely on private vehicles or informal transport options (Cervero and Golub, 2007).

Transportation in Abidjan significantly contributes to environmental degradation, with vehicle emissions being a major source of air pollution. The reliance on older vehicles and motorcycles, many of which do not meet emissions standards, exacerbates the problem. Additionally, congestion leads to increased fuel consumption and greenhouse gas emissions, contributing to climate change and affecting public health (Sperling and Cannon, 2004).

Investments in the development and expansion of public transportation, including the introduction of Bus Rapid Transit (BRT) systems and exploring options for light rail or metro, can provide efficient and sustainable alternatives to private vehicle use. Improving the reliability, coverage, and capacity of public transit is essential for reducing congestion and enhancing mobility (ADB, 2018). Encouraging the use of sustainable modes of transportation, such as cycling, walking, and electric vehicles, can mitigate environmental impacts and improve urban life. Investments in cycling infrastructure, pedestrian-friendly urban design, and incentives for electric vehicle use are key components of sustainable mobility strategies (Litman, 2015). Upgrading road infrastructure, including the maintenance of existing roads and the construction of new arteries to alleviate bottlenecks, is critical. Implementing intelligent traffic management systems can also enhance the efficiency of road use and reduce congestion (Pojani and Stead, 2015). Formalizing and integrating informal transportation services into the city's overall transportation planning can improve service quality and safety. Establishing regulatory frameworks and supporting informal transport operators to upgrade their vehicles and services can contribute to a more cohesive and efficient transportation system (Salazar Ferro et al., 2015).

3.12. Traffic Jam in Abidjan

Traffic congestion in Abidjan, the economic capital of Côte d'Ivoire, presents significant challenges to urban mobility, economic productivity, and the quality of life for its residents. The city's rapid population growth, urban sprawl, and insufficient transportation infrastructure have exacerbated these congestion issues.

The expansion of housing settlements and the construction of infrastructure networks played significant roles in shaping the structure of Abidjan (Semboloni, 1999). The presence of the lagoon in the city created challenges, making communication between different zones, especially from north to south, more difficult. The unique geographic aspect prevented the city from assuming a traditional radial form and instead fostered the growth of peripheral centers.

According to Morisset, (2019), the expense of the time spent on transport is one of the everyday difficulties of city life. When travel is sluggish and expensive, it is impossible to imagine an efficient and productive city. The poorest residents of Abidjan who rely on public transport spend 20% to 30% of their income on transportation and spend 200 minutes per day using or waiting for it. Added to these expenses are commercial competitiveness losses, as well as safety and pollution. According to a recent economic report for Côte d'Ivoire, a lack of mobility in the Abidjan metropolitan region costs the country 4% to 5% of its national GDP.

Traffic congestion in Abidjan is caused by several issues such as rapid urbanization and population growth, inadequate public transportation, impacts of traffic congestion, urban sprawl, poor road infrastructure, economic costs, environmental pollution, and social and health effects.

Abidjan has experienced significant urbanization, with its population increasing rapidly due to natural growth and migration. This expansion has outpaced the development of the city's road infrastructure and public transportation systems. The limited capacity and coverage of public transportation options, including buses and minibuses (gbakas), force many residents to rely on personal vehicles or informal transportation methods, contributing to road congestion. The spread of the city into wider geographic areas without adequate

transportation planning has led to increased travel distances and reliance on personal vehicles, further straining the existing road networks.



Figure 3.26. Traffic jam in Abidjan

Many roads in Abidjan are in poor condition, with frequent potholes and inadequate maintenance. Additionally, the lack of sufficient alternative routes and bypasses around high-traffic areas contributes to bottlenecks. Traffic jams lead to significant economic losses due to increased transportation costs, lost productivity, and higher operational costs for businesses. The delays and unpredictability associated with congestion can hinder economic activities and deter investment. Prolonged idling and slow-moving traffic contribute to higher emissions of greenhouse gases and pollutants, adversely affecting air quality and contributing to environmental degradation. Traffic congestion increases stress levels among commuters, reduces time available for family and recreational activities, and contributes to health problems related to pollution and sedentary lifestyles.



Figure 3.27. Traffic jam in Abidjan

As the city expanded, travel distances increased, distancing the population from workplaces. Average distances traveled were greater as one moved away from the city center. The structure of activities, especially formal ones, contributed to this pattern. Outward fluxes from each zone resembled a star shape, with the city's CBD at the center. Autonomous zones emerged on the borders of central areas. Efforts to utilize the existing railway for commuting aimed to reduce travel distances by 50% (Semboloni, 1999).

Addressing traffic congestion in Abidjan requires a multifaceted approach that combines infrastructure development, efficient public transportation, sustainable urban planning, and the promotion of alternative transport modes. Collaborative efforts involving government authorities, the private sector, and international partners are crucial for implementing effective solutions and improving urban mobility in Abidjan. Investing in reliable and efficient public transportation systems, such as expanding the SOTRA bus network, introducing rapid transit lanes, and completing the Metro d'Abidjan project, can provide viable alternatives to personal vehicle use. Upgrading road conditions, constructing new

bypasses and bridges, and implementing intelligent traffic management systems can alleviate bottlenecks and improve traffic flow. Adopting comprehensive urban planning strategies that promote mixed-use developments, reduce travel distances, and encourage the use of non-motorized transport can mitigate the impacts of urban sprawl. Initiatives to promote carpooling, cycling, and walking, along with the development of the necessary infrastructure, can reduce the dependence on personal vehicles.

3.13. Agglomeration Dynamics in Abidjan

The Greater Abidjan Area (GAA), encompassing Abidjan City and its surrounding urban and semi-urban regions, represents a complex and dynamic urban entity. It comprises several municipalities and experienced rapid urbanization over the years. The population growth and migration to urban areas have resulted in the expansion of the city's boundaries and the emergence of informal settlements. The urbanization process has created challenges in terms of urban planning, housing, and transportation infrastructure development.

Transport systems play a crucial role in urban development and societal well-being, acting as arteries that support the flow of goods, services, and people within and between urban areas. In developing countries, the availability, accessibility, and affordability of transportation have significant implications for social inclusion and economic development. The linkage between social exclusion and transport has been understudied in Sub-Saharan cities such as Abidjan, with limited research exploring this interface. The practice has outpaced research, highlighting potential concerns regarding the alignment of transport policy, as evidenced by certain community transport schemes. Furthermore, there is a scarcity of studies examining the specific context of Abidjan City, which motivated this study to identify and address the research gap.

As Morisset, (2019) points out, the rising urbanization of Côte d'Ivoire is, in principle, positive news because the most urbanized nations are also the wealthiest. The theory of economics and experience have proven that urbanization was a significant driver of economic growth due to the establishment of agglomeration effects and greater access to infrastructure and social resources by people. It is therefore unsurprising that Abidjan is home to nearly 80% of the country's formal enterprises and that wages there are twice as

high as elsewhere. School enrolment rates are also higher in Abidjan, as are almost all other indices of access to welfare services and essential facilities.

The transport sector in Abidjan is complex and diverse, consisting of various modes of transportation, including railways, roads, waterways, and air transport. However, the road network plays a dominant role in the Abidjan transportation system, catering to the majority of passenger and freight movements. This analysis provides a deep and detailed understanding of the transportation landscape in the GAA, including the transport development process, the current transport facilities, the distribution of population, and the opportunities mapping within the city. The sector faces challenges such as traffic congestion, inadequate infrastructure, and insufficient investment in public transportation.

According to JICA (2020), Abidjan has undergone numerous planning phases since 1928 in response to the city's expansion. A large portion of the urban infrastructure, including its roads, ports, and railways was constructed during the 'ivory miracle' period of the 1960s and 1970s, when the country's economy grew by an average of 8% per year. The population increased quickly without infrastructure and urban development's planned investments (3.38 million in 1998 → 5.05 million in 2014 → 6.3 million in 2021), resulting in widespread urbanization, lower service levels, aged infrastructure, shortages of capacity, and so on. However, due to the country's complex political crises and internal division between 1999 and 2011, the population increased fast without planned urban and infrastructure development investment.

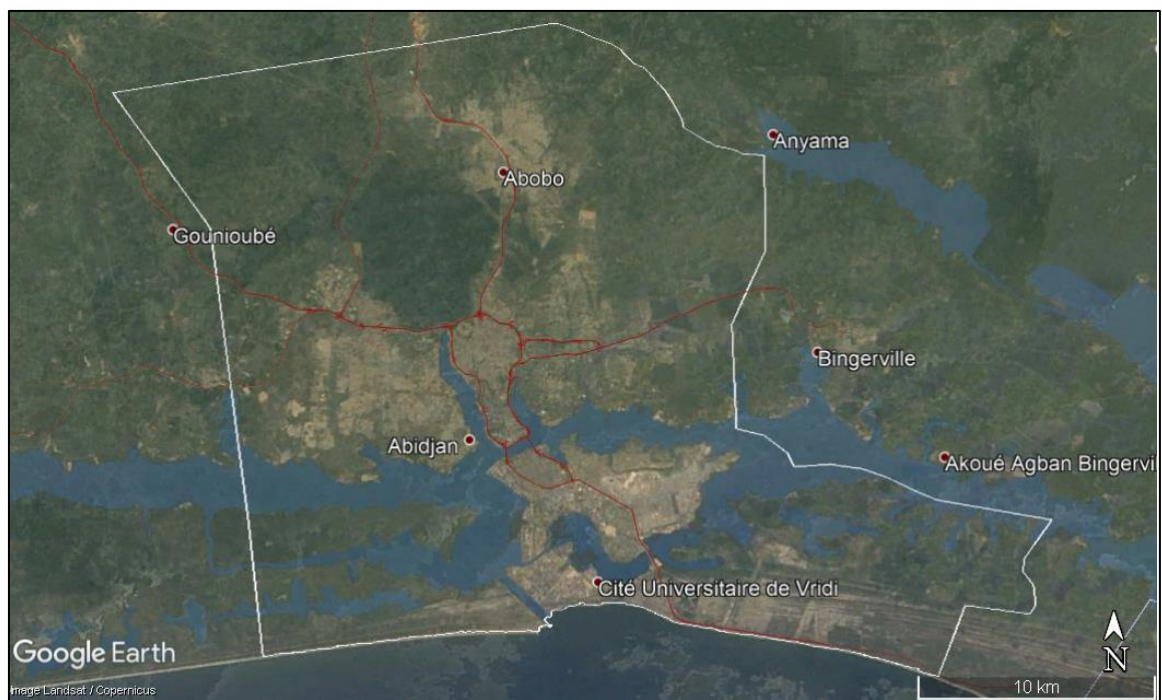


Figure 3.28. 1984 Map - Abidjan's rapid urbanization process

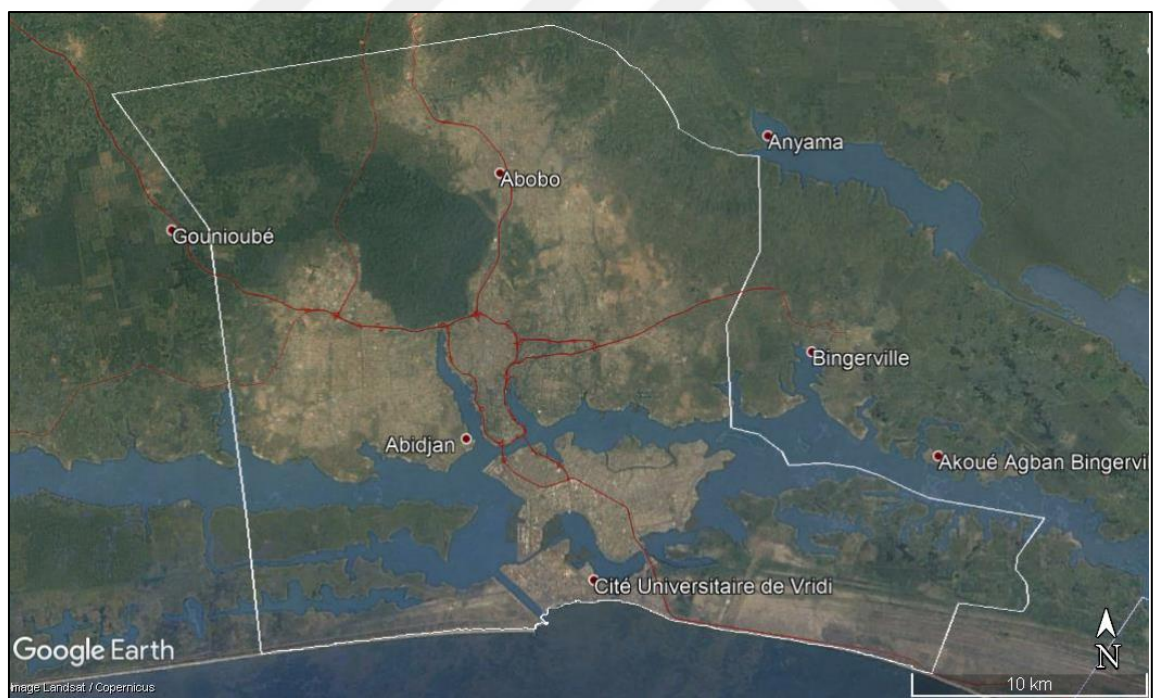


Figure 3.29. 2000 Map - Abidjan's rapid urbanization process

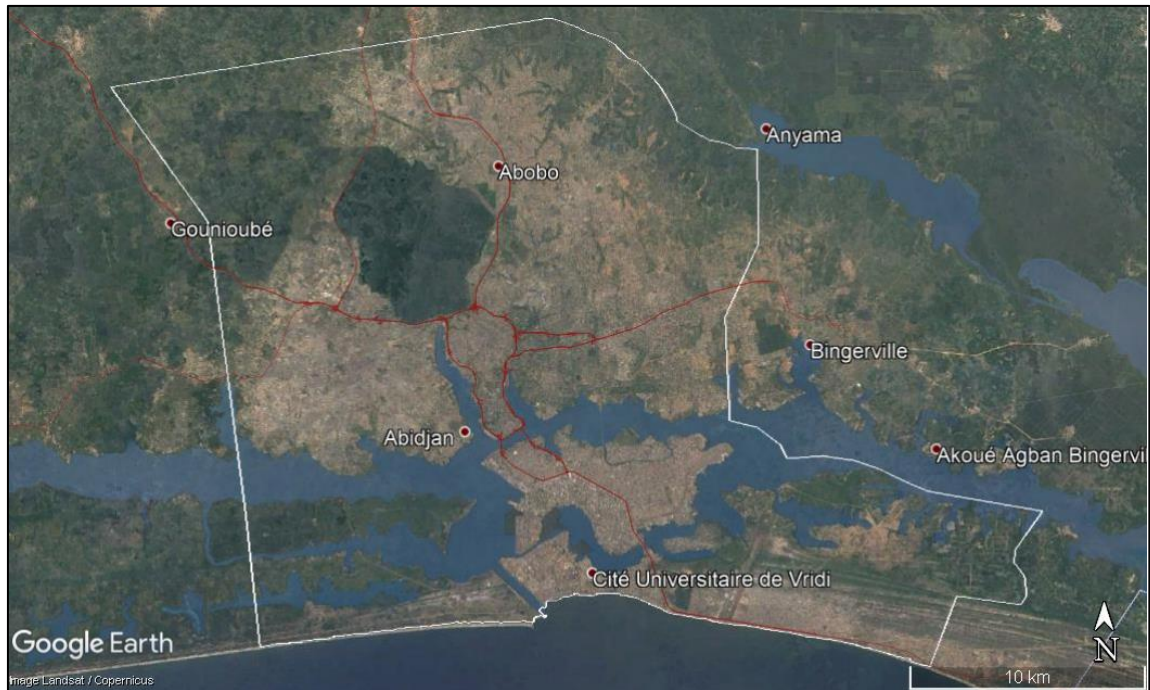


Figure 3.30. 2015 Map - Abidjan's rapid urbanization process

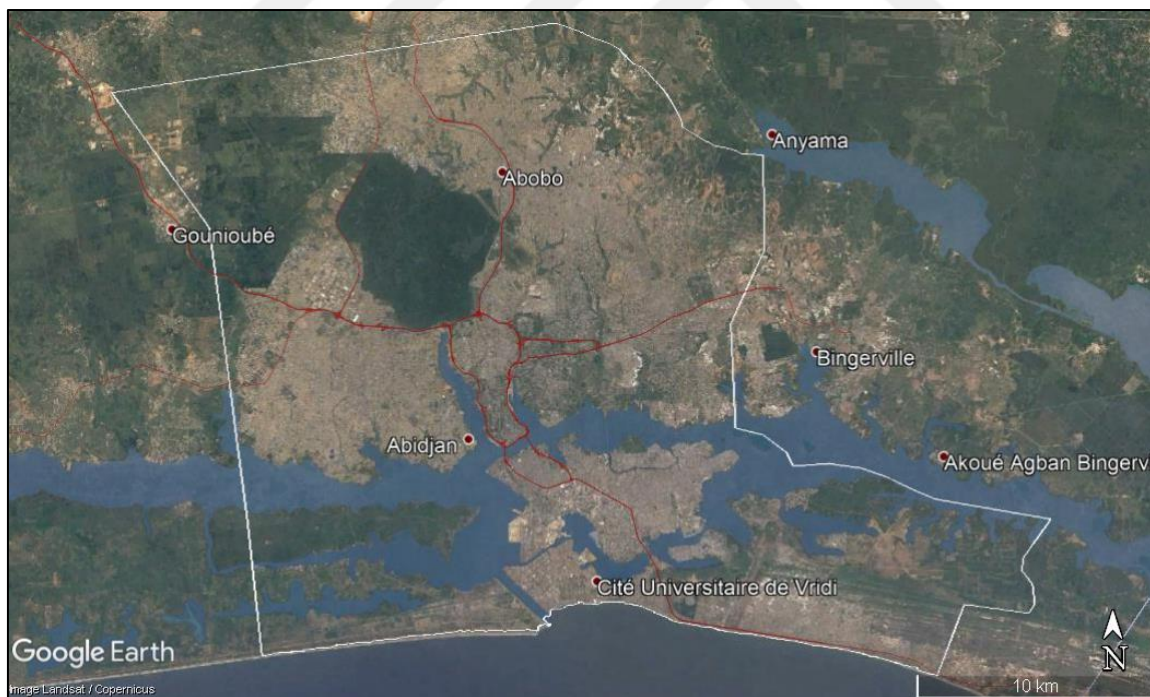


Figure 3.31. 2021 Map - Abidjan's rapid urbanization process

Additionally, since the political crisis ended, the nation has had an economic growth of almost 7% and a population increase of about 2.5% annually. According to the Global Cities Institute (2014), by 2050, Abidjan City's population will double to 10.71 million. To adapt

to these challenges, the city must improve the delivery of urban utility services (such as water, sewage, and garbage collection) and transportation and create an urban structure that minimizes environmental impact while accommodating a rapidly expanding population (MCLU and JICA, 2020).

One contributing factor is the longer distances that low-income people typically need to travel to access goods, services, and employment opportunities. In part, this is due, to the spatial mismatch between the peripheral suburban locations where people often reside and the more central areas of cities where key activities are concentrated (Semboloni, 1999). Another factor is the high cost associated with the transportation options predominantly used by low-income individuals, which are typically informal, unsubsidized, and largely unregulated. In the South African context, this situation is further exacerbated by the geographical legacy of apartheid. Non-White South Africans were historically compelled to settle in peripheral and isolated locations, and the lingering effects of this policy persist to this day (Scheidegger, 2009).

Inadequate access to employment centers, business hubs, and medical services for low-income groups, the elderly, and single-parent families reflects the hardships of social exclusion (Paez et al., 2009). The primary challenge lies in establishing new networks that can offer adequate connectivity for individuals with low incomes, connecting their residential areas to essential destinations such as workplaces, schools, colleges, medical centers, day-care facilities, and shopping centers. It is important to acknowledge these challenges as they extend beyond the scope of transport policy and require comprehensive solutions.

Exclusion from essential facilities can arise when there is a lack of availability or significant distance between key opportunities, such as healthcare, employment, schools, leisure services, or shops, and where an individual resides (Luz and Portugal, 2022). Furthermore, even if these opportunities are accessible by public transportation, they may not be suitable for the needs of individuals. Diversifying the range of activities within an area presents an opportunity to reduce the necessity for individuals to seek employment and services outside the CBD, thereby impacting travel distances, travel times, and the viability of alternative modes of transportation such as cycling, walking, and public transport (Ma et al., 2018). Areas with greater diversity enable individuals to access activities by walking, which can

alleviate the need for private car ownership and associated expenses (Van Wee and Geurs, 2011).

Recent research has shed light on the connection between transportation vulnerability and social exclusion. An efficient public transportation system in Abidjan seeks to normalize the usage of modes equally among all members of society (Johnstone and Ratanavaraha, 2020). In particular, automobile travel costs are expensive for lower and middle-income people. Also, disabled people, women, and the elderly have difficulties traveling and crossing roads. It is essential to provide affordable and accessible transportation services to address social exclusion. The choice of different travel modes, such as bicycles, private cars, or buses, can result in varying actual travel times, ultimately affecting OOH activities. Limited transportation options, particularly for those unable to drive, can lead to time-consuming journeys to access services and goods.

3.14. Existing Transport Facilities in the City: Between Informality and Challenges

Abidjan has a mix of transport facilities, including major road networks, bus services, taxi systems, and informal modes of transport such as minibusses and motorcycles. The city has witnessed ongoing efforts to improve public transportation services through the introduction of BRT systems and the expansion of the rail network. However, the existing transport facilities are still insufficient to meet the growing demand and address the needs of the population mobility.

Abidjan, the country's commercial hub, is home to a sophisticated and extensive transportation system that can accommodate the needs of the continuously growing population. The comprehensive transportation system in Abidjan includes water transportation, buses, taxis, informal minibusses, and motorcyclists. Transportation in Abidjan relies heavily on the bus system (Doumbia et al., 2021). The Société des Transports Abidjanais (SOTRA) runs a network of bus lines throughout the city. However, it should be noted that the Abidjan bus system confronts difficulties such as insufficient fleet size, old vehicles, and occasional service interruptions.

There is a well-established informal minibuss system in Abidjan called "gbakas" or "wôro-wôro" (Doumbia et al., 2021). Privately owned and operating on ad hoc routes, these

minibusses are often needed to supplement the established bus system. Gbakas are renowned for adaptability since they may pick up and drop off passengers anywhere along their route. The taxi service in Abidjan is also essential to the city's infrastructure. Motorcycles, often known as "zémidjans" or "motos," are frequently employed for short-distance transport and as a way of avoiding traffic (Doumbia et al., 2021). Given its position on the Ebrié Lagoon, Abidjan's reliance on water transport is not surprising. Numerous boats and ferries travel the lagoon, linking the city's neighborhoods with remote locations (Doumbia et al., 2021).

The widely used modes in this city are informal (minibusses, taxis) and private cars. While the use of public transit and motorcycles is negligible (Johnstone and Ratanavaraha, 2020). People also travel by walking or bicycle for short trips. The private modes of transport i.e. woro-woro, meter taxis, inter-communal taxis, and gbaka account for 85% of trips (Berrou, 2018). These operators pose a higher risk of safety, pollution, and congestion. Motorcycles are not a common mode in the Abidjan area as compared to other cities (Doumbia et al., 2021). A study evaluated the results that in many areas, the lack of public transport options during needed times and locations leaves people with limited choices, forcing them to rely on kombi informal taxis-buses (Lucas, 2010). However, the services cost is disproportionately high compared to the people's incomes, making them affordable mostly for those who are employed. Unfortunately, these journeys are often excessively long, uncomfortable, unsafe, and exhausting, with wait times for taxis being particularly extended. It often entails long walks from and to pick-up points and waiting in a non-secure environment. The integrated bus infrastructure plan in Abidjan is proposed for the future with the upgrading of BRT and a higher level of service. It consists of a ferry service, airport, multi-modal transit, logistic center, local bus service, and upgraded freight (Johnstone and Ratanavaraha, 2020).

In terms of planning, JICA carried out between 2013 and 2015 a project of master plans with 2030 as the target year, referred to as "The project for the development of the urban master plan in greater Abidjan" (SDUGA - Schéma Directeur d'Urbanisme du Grand Abidjan). For the Autonomous Region of Abidjan, which consists of 13 municipalities and six neighboring municipalities/counties, the project facilitated the creation of an urban transport master plan and an urban master plan. After getting official approval in 2016, the master plans were widely utilized by the government and donor organizations, resulting in the realization of

several priority projects in the projected urban transportation network (MCLU and JICA, 2020).

A significant issue in Abidjan is that many areas need access to regular transportation services, including public transit. According to a World Bank report, only around 15% of city inhabitants utilize the city's official transport framework. Due to this, most people need to rely on less traditional transportation methods, including motorcycle cabs and ridesharing services (World Bank, 2019b). Yopougon is one of Abidjan's central suburbs. However, inhabitants there have to depend on overcrowded and often dangerous informal modes of transportation because of a lack of access to public transportation. Another challenge is that the established public transportation network needs more vehicles and routes. This causes congestion and delays at bus terminals, especially during rush hours. The Department of Transport approximates that 80 percent of Abidjan's people have trouble using public transportation because of a lack of buses (World Bank, 2019c).

Residents in underdeveloped communities like Abobo often depend on packed shared taxis known as "woro-woro" to get through the city because official transportation options are few in these areas. These taxis often carry more people than they can safely accommodate, which causes discomfort. Additionally, those who use public transportation to go to their destinations often encounter lengthy wait periods and erratic timetables. According to a study by the World Bank, the average daily commute distance for Abidjan inhabitants is around 9 kilometers (World Bank, 2019c). The inefficiencies and difficulties experienced by commuters owing to the inadequacy of access to dependable public transport are highlighted by the average travel duration for these trips, which is close to 90 minutes.

Also, following data analysis from the government's Ministry of Transport, just 35% of Abidjan's inhabitants reside 500 meters or less from a public transportation terminal (World Bank, 2019c). The absence of accessibility to public transport makes life harder for inhabitants, especially those in low-income zones, where traveling to places of employment, educational institutions, and medical facilities is harder. According to a study by the ADB, household spending on transportation in Abidjan makes up around 20% of total monthly expenses (World Bank, 2019c). This high percentage emphasizes how monetarily burdened families are, specifically those with low incomes. This forces many people to rely on unsafe,

less convenient transportation methods, such as walking longer distances or using public transportation less often.

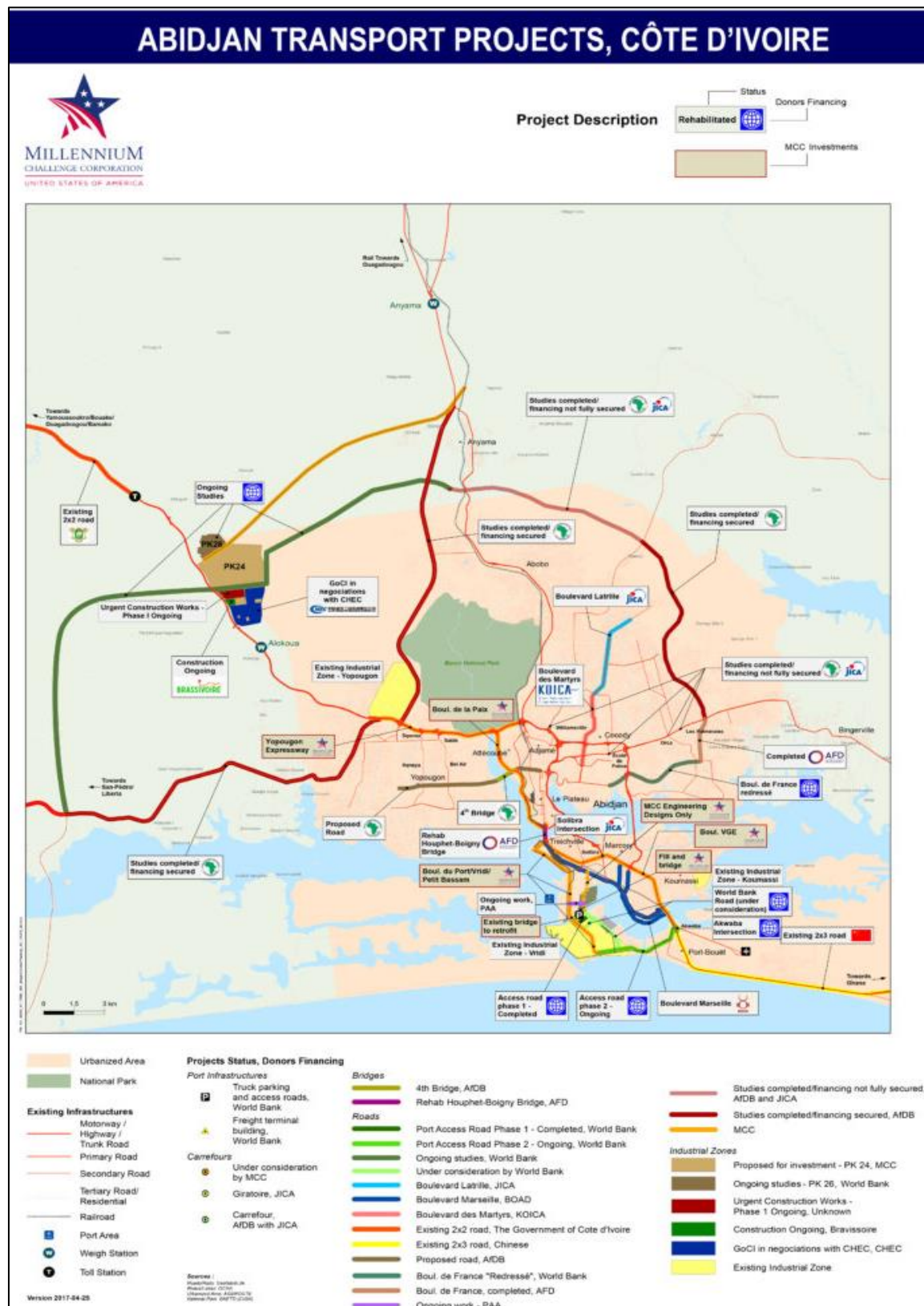


Figure 3.32. Map of infrastructure projects in Abidjan

Sempéré and Linder (2023) assert that the Greater Abidjan region has committed to a significant investment and infrastructure upgrading initiative. Rebalancing supply and demand in the high-capacity transportation industry is one of the main priorities; this will enable more consumers to be served over a greater distance without experiencing an increase in travel time or expense. One key area for development is the connection of the suburban area to the city center. To regain control over the extremely difficult yet crucial sectors of transportation and mobility, which the city experiences more often than it controls, it is necessary to encourage urban expansion (Sempéré and Linder, 2023).

3.15. The SDUGA Master Plan (Schéma Directeur d'Urbanisme du Grand Abidjan)

The SDUGA Master Plan represents a comprehensive approach to urban planning and development, aimed at addressing the multifaceted challenges faced by the rapidly growing Abidjan city. The SDUGA Master Plan provides insights to foster sustainable urban development and governance applied to the Greater Abidjan Area (GAA) real-world urban contexts. As a comprehensive master plan, SDUGA includes several key components:

- **Land Use Planning:** Detailed strategies for the use of land within the urban area, including zoning for residential, commercial, industrial, and recreational uses.
- **Transportation Network Design:** Plans for the development of road, rail, air, and maritime transportation infrastructure to support both current and future mobility needs.
- **Public Transit System Expansion:** Proposals for expanding public transportation services, such as bus, light rail, and subway systems, to improve accessibility and reduce reliance on personal vehicles.
- **Housing and Community Development:** Strategies to address housing needs, particularly affordable housing, and to foster the development of cohesive communities with access to essential services.
- **Environmental Management:** Initiatives to address environmental challenges, including waste management, air and water quality, and climate change adaptation measures.
- **Economic Development Initiatives:** Programs and policies designed to attract investment, support local businesses, and create jobs in key sectors.

However, implementing the SDUGA master plan in Abidjan faces several challenges, including securing adequate funding, coordinating among various stakeholders, managing

rapid urbanization pressures, and ensuring that projects are completed on time and within budget.

Several difficulties have occurred during the process of urban development by the SDUGA Master Plan. The SDUGA recommends the creation of a planning management structure involving municipalities, provinces, central ministries, and other parties involved in implementation. Nevertheless, many years after the Government approved SDUGA, this has not been accomplished. The first issue is the absence of a cross-organizational mechanism coordination at the overall planning level. Due to this, the SDUGA evaluated sectoral spatial planning for transportation and land use, but additional cooperation with other sectors of urban infrastructure (sewerage, trash, water, etc.) in terms of facility and network layout planning is necessary (MCLU and JICA, 2020).

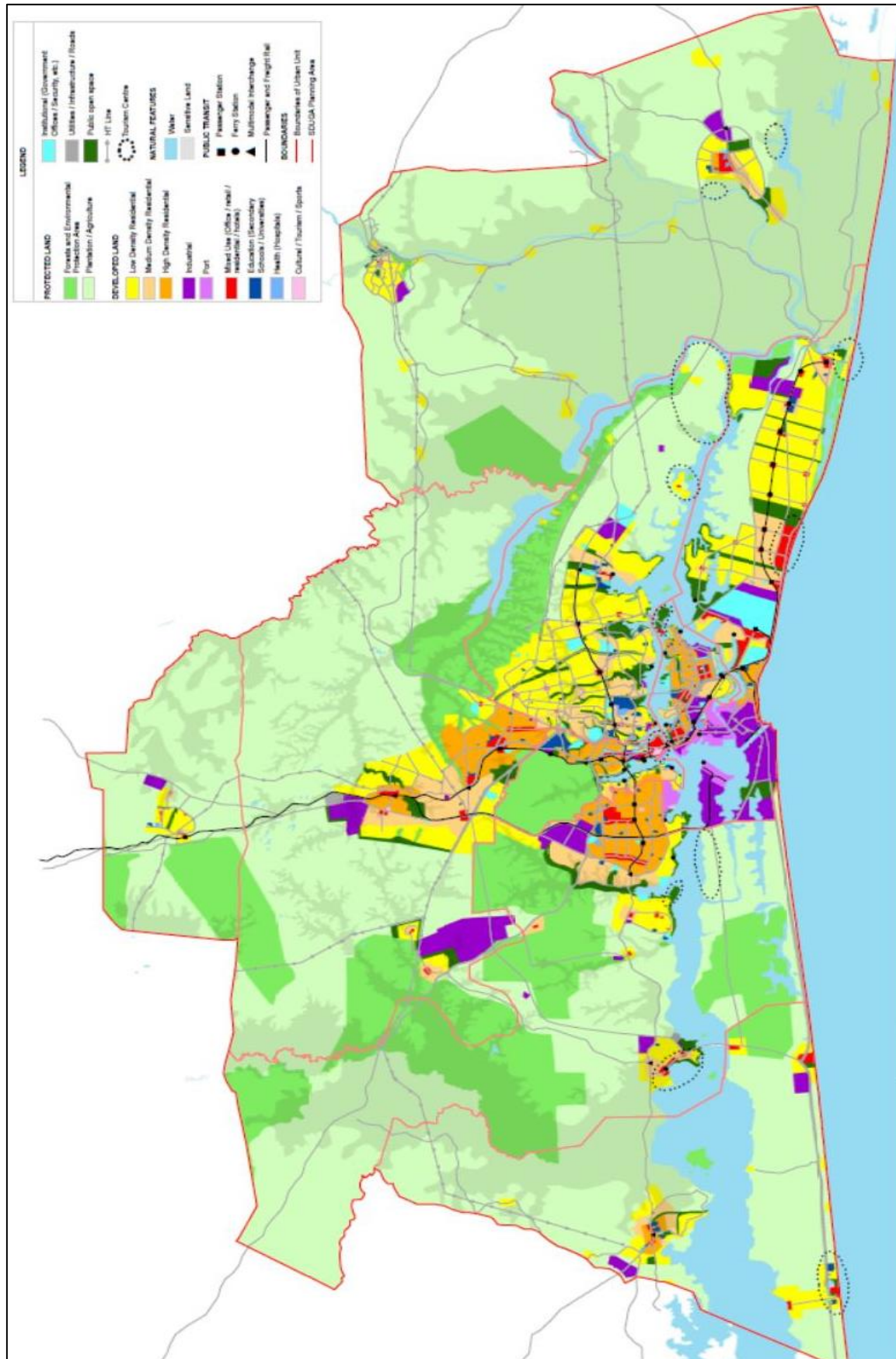


Figure 3.33. Projects Map of the 2030 Greater Abidjan Master Plan

Secondly, the necessary legislation, organization, planning, implementation programs, etc., have not been taken into account or developed to realize the metropolitan zone development policy described in the SDUGA and at the particular district-level-specific concepts. The MCLU (Ministry of Construction, Housing, and Urban Planning) is currently the development permit authority and will be in charge of managing sustainable urban development, despite the possibility of other donors cooperating in the creation of PUD (detailed urban plans), which serve as the foundation for development permits. Urban development management needs to be strengthened and improved from the standpoint of sustainable urban development management, including collaboration with local authorities and the division of duties. Additionally, although the public administration is in charge of the ongoing PUD development process, coordination with stakeholders, including citizens, is crucial to enhancing the efficacy of the developed plans (MCLU and JICA, 2020).

Thirdly, in the area of urban transport, priority projects outlined in the SDUGA are coming to fruition more quickly than anticipated at the time the master plan was developed. One example is the choice to support financially the MRT and BRT, which are major transportation networks. To further encourage execution, priority projects must be updated, including plans for the transportation network. The necessity to improve services and convenience for the whole public transportation network, including coordination and linking of various transportation systems, has arisen in addition to the expansion of transportation infrastructure. Additionally, priority must be given to the creation of the framework for promoting and overseeing the execution of urban growth by SDUGA, the creation of small district-level plans, and the updating of the master plan for urban transport (MCLU and JICA, 2020). The SDUGA's success requires strong governance, effective public-private partnerships, community engagement, and ongoing monitoring and evaluation to adjust strategies as needed.

3.16. Accessibility and Transport Disadvantages in Abidjan

The transportation system in Abidjan has further challenges due to the city's growth. By 2040, the capital's inhabitants are projected to be about 10 million; by 2050, over two-thirds of Ivoirians will likely reside in city areas (World Bank, 2019a). The problems of traffic cramming, gridlocked roads, and inadequate roadways are made worse by the growing urbanization, which adds to the burden already placed on the structure for transportation. In

turn, this has an impression on the accessibility and reliability of public transportation, making it more stimulating for residents to go to places of work, colleges and universities, and hospitals.

Most people in Abidjan work on islands and lagoons but live on the mainland, thereby commuting time is problematic for them. Since commuting time on average is too long (Freund, 2001). During Abidjan's early development, the success of firms was closely tied to transportation accessibility, including railways, roads, and the nearby port (Semboloni, 1999). This advantage solidified as the national public administration was located in the city. The different travel modes choice, such as private cars, bicycles, or buses, can result in varying actual travel times, ultimately affecting healthcare utilization. Limited transportation options, particularly for those unable to drive, can lead to time-consuming journeys to access healthcare services (Vickers, 2017). Promoting public transportation has been shown to increase outpatient service utilization (Choi et al., 2019).

Abidjan's lack of a reliable and complete public transportation infrastructure makes the difficulties more difficult. Public transportation now accounts for fewer than 10% of all travel, with the bulk of journeys performed on foot due to cost restrictions encountered by the poorest families (World Bank, 2019a). Traffic congestion, dangerous conditions, and pollution result from people using informal transportation methods like shared cabs and minibusses. Furthermore, the geographic reach of these informal transportation options is unequal, with profitable routes given priority over those that would best serve the requirements of all locals.

The current roads in Abidjan City are very poor and small, therefore, it hinders the movement of goods via train and reduces economic trade-off (Gamassa and Chen, 2017). The poorest people live farther away from the roads that are the hub of economic activities including markets and small restaurants (Freund, 2001). There is a great difference between the poorest and richest in Abidjan City regarding residential sites. A study by Currie et al. (2010) investigates travel patterns among individuals categorized as "transport poor" and "transport rich", as well as those experiencing economic and mobility disadvantages. It specifically addresses the concept of "forced" car ownership, wherein individuals perceive no choice but to purchase a car to connect with others and access essential services.

The availability, accessibility, price, and standard of public transportation in Abidjan are all significantly affected by socio-economic characteristics. The unbalanced circulation of profits in the city is one of the trademarks of social exclusion and poverty. Though Côte d'Ivoire's usually good financial trajectory and recent development in GDP averages about 7%, the recompenses of this development have not been equally circulated among the population. Despite the substantial growth in the nation's earnings, about 46% of Ivoirians subsist on less than CFAF 750 (around USD 1.30) daily in 2015 (World Bank, 2019a).

The price is significant for many inhabitants, specifically those from lower-income families. Abidjan's public transportation prices might be pricey for those on low incomes. The median monthly wage in Ivory Coast is approximately \$250,000 CFA francs (about \$440), as reported by the country's National Institute of Statistics. Moreover, a single bus journey might cost over \$200 CFA francs (roughly \$0.35) (Gueu, 2017). It also makes it more challenging for those with uncertain earnings to pay for transport regularly, constraining their access to vital goods and services. A large part of the problem with Abidjan's public transportation is that its vehicles need to be updated and better maintained. Buses are known for their crowding, discomfort, and accidents. Travelers often experience delays and schedule disruptions (Gueu, 2017). Buses, for instance, often get complaints from riders about their poor condition, lack of seats, ventilation issues, and illumination.

The capacity of individuals and families to pay for and use dependable public transportation is directly impacted by this wealth difference. Some families in Abidjan spend more than 30% of their income on transportation, with expenditures like tickets and gasoline accounting for a substantial portion of family budgets (World Bank, 2019a). The poorest families are disproportionately impacted by the high cost of transportation, which restricts their mobility choices and perpetuates a vicious cycle of social exclusion and restricted access to job possibilities.

One of the main goals of an efficient public transport system in Abidjan City is equity which normalizes the usage of mode equally among all the society members (Johnstone and Ratanavaraha, 2020). All modes of transport should be moved freely around the city. Especially, the charges of traveling via automobile are expensive to low-middle income people. Also, the handicapped and middle-aged citizens or elderly found difficulties in traveling and road crossing. The affordability and provision of transport services are two

basic requirements to handle social exclusion. The widely used modes in this city are informal (minibusses, taxis) and private cars. While the use of public transit and motorcycles is negligible (Johnstone and Ratanavaraha, 2020). People also travel by walking or bicycle for short trips. The integrated bus infrastructure plan is proposed for the future with the upgrading of BRT and a higher level of service. It consists of a ferry service, airport, multi-modal transit, logistic center, local bus service, and upgraded freight. No doubt, these steps are a great initiative in building a green transport environment by promoting walking and public transit modes considering the socioeconomic status of citizens.

Abidjan presents a unique case study due to its rapid urban expansion, diverse population, and the critical role of transport in its post-conflict recovery process (Liu and Chen, 2022). The city's transport challenges reflect broader issues faced by many developing countries but are also shaped by its specific historical, social, and economic contexts.

To understand the social exclusion issue in Abidjan and its impact on individuals, transport dynamics and mobility trends are the main factors to analyze. According to (Janet, 2007), social exclusion is a notion that refers to a selectively operated process of differentiation that can be made more severe by the spatial peculiarities of transportation. Recent research has shed light on the interconnection between transportation vulnerability and social exclusion. One of the main goals of an efficient public transport system in Abidjan City is equity which normalizes the usage of mode equally among all the society members (Johnstone and Ratanavaraha, 2020).

Abidjan's current public transportation system is primarily intended for long-distance travel and needs to provide more connections among neighborhoods and communities to meet these demands fully. Women in Abidjan seem to commute less than men, and female mobility may be restricted by societal conventions, safety concerns, and a lack of public transport availability. Females are susceptible to assault and harassment due to their gender while using public transportation, which restricts their freedom of movement. A part of the women in Abidjan said they felt uneasy utilizing the public transportation system. Their movement is restricted by fear of harassment and violence, hindering their access to vital services like jobs, education, and healthcare.

In addition, compared to males, women often travel in Abidjan through a variety of means. They are more likely to participate in care-related activities like dropping kids off at school or seeing the doctor. These journeys often include many stops and short distances, necessitating adaptable and practical transportation solutions. However, the absence of dependable and safe transportation options further impacts women's economic prospects. Due to safety concerns and the need for better transportation options, women are less likely to obtain work opportunities that entail lengthy commutes. This exacerbates gender disparities in the workforce and the gender pay gap. The absence of accessible and inexpensive transportation choices also makes it difficult for women to participate in social and communal events, aggravating their marginalization.



4. RESEARCH METHOD AND DESIGN

4.1. Objective of the Research

The research aims to provide a comprehensive understanding of TRSE in Abidjan, identify the most affected populations, and suggest targeted interventions to mitigate these challenges. Exploring the nuanced interplay between transportation access disparities and social exclusion in Abidjan, this thesis focuses on the role of TRSE within the city's economic, cultural, and social fabric. It seeks to understand public transportation dynamics, individuals' perceptions of exclusion, and the impact of TRSE on daily mobility and participation in activities. It examines how TRSE is impacted by socioeconomic and spatial factors in a developing city like Abidjan, including how accessibility, affordability, availability, and acceptability of transportation services affect diverse social groups.

The following objectives guide this inquiry:

- To assess the current state of public transportation in Abidjan: Evaluate the accessibility, affordability, safety, and reliability of public transport systems to understand how these factors contribute to TRSE;
- To identify populations most affected by TRSE: Determine which demographic groups are most vulnerable to social exclusion due to inadequate transportation, focusing on income level, age, gender, and physical ability;
- To analyze the impact of TRSE on access to essential services: Examine how limitations in the public transport system affect access to employment, education, healthcare, and social activities;
- To explore policy and planning solutions to reduce TRSE: Identify and evaluate current transport policies and planning practices in Abidjan, proposing recommendations for more inclusive transportation planning.

4.2. Research Significance

Transport systems play a crucial role in the economic and social development of cities around the world. In developing countries, the interplay between transport availability and social exclusion presents a unique challenge, impacting the lives of millions.

Social exclusion in the context of transport refers to the process by which certain groups are prevented from participating fully in the socio-economic life of a city due to inadequate access to transportation services. This can lead to limited access to employment, education, healthcare, and other essential services, further entrenching patterns of poverty and inequality. The issue is particularly acute in developing countries, where urban planning and transport infrastructure often lag behind the rapid pace of urban migration and growth.

The city of Abidjan, Côte d'Ivoire, serves as an exemplary case study for analyzing these dynamics due to its rapid urbanization and the unique challenges it faces in providing equitable transport options to its diverse population. This study investigates TRSE and its impact on daily mobility and participation in activities within the context of Abidjan, a developing city.

This research sheds light on the intricate relationship between transport and social exclusion in developing countries, using Abidjan as a focal point and analyzing how public transportation dynamics influence perceptions of social exclusion among residents, considering the unique social, economic, and cultural context of the city. By examining the city's transport infrastructure and policies, this study seeks to understand how transport contributes to or mitigates social exclusion and to propose strategies for creating more inclusive urban mobility systems.

4.3. The Research Questions

To understand this issue of TRSE and the links between activity participation, mobility, and social exclusion in a developing city's public transportation context such as Abidjan, the research answers the following questions:

- What mechanisms underpin the influence of socioeconomic status and geographic location on TRSE in Abidjan and how do these mechanisms manifest in the daily lives of affected populations?

This question seeks to dissect the critical factors affecting vulnerable groups and contributing to TRSE in Abidjan.

- Which demographic groups are disproportionately affected by TRSE in Abidjan, and what are the specific challenges they face?

By identifying the most vulnerable groups, this question aims to highlight the intersections between transportation inequities and broader social vulnerabilities.

- How does TRSE impact individuals' access to employment, education, healthcare, and social participation in Abidjan?

This inquiry delves into the tangible effects of transportation barriers on daily life and societal engagement, mapping the broader socio-economic repercussions of TRSE.

- What policies and planning practices can be implemented or improved to mitigate TRSE in Abidjan, and how can these interventions be tailored to address these root causes and promote more inclusive urban mobility?

Focusing on solutions, this question explores actionable strategies and policy interventions that can address the identified challenges and foster a more equitable transportation system in Abidjan.

These questions help to hypothesize and catch the main insights on the issue. To answer those questions, hypotheses have been developed to understand the issue of TRSE and the links between mobility, activity participation, and social exclusion in a developing city's public transportation context such as Abidjan.

4.4. Hypotheses

The main assumption is that socioeconomic status and geographic location are significantly correlated with TRSE in Abidjan, with vulnerable groups and residents of peripheral areas experiencing higher levels of exclusion. Hypotheses supporting this thesis, which will be tested within the scope of the research and will address the issue of TRSE are given to facilitate the testing as follows:

- H1: The frequency of women's participation in OOH activities is significantly lower than that of men. Primarily due to their perceptions of safety and security on public

transportation. This suggests that women's mobility and social inclusion in Abidjan are influenced by transportation access, framing it as a critical gendered issue.

- H2: Individuals with lower incomes engage less frequently in OOH activities. There is a direct relationship between an increase in monthly income and the frequency of participation in such activities. This pattern suggests a link between lower economic status and diminished engagement in OOH activities.
- H3: Individuals from households with personal vehicles participate in activities at a higher frequency compared to those without private transportation. This indicates that vehicle ownership is a significant determinant of mobility and engagement in activities, highlighting disparities in access to transportation.
- H4: Vulnerable populations (the elderly, women, disabled individuals, and children) utilize public transportation less frequently than other demographic groups. This disparity in usage can be attributed to a range of factors, including physical challenges, cultural norms, and gender roles influence, all of which significantly influence the mobility patterns of these groups. Such dynamics underscore the critical need to examine mobility behaviors and the perceptions of TRSE within the intricate sociocultural fabric of Abidjan.
- H5: Less educated individuals are more likely to miss or cancel activities, while those with higher educational levels demonstrate a preference for private cars for daily commutes. This suggests an educational divide in transportation preferences and access. Educational attainment plays a pivotal role in activity engagement and transportation mode choice.
- H6: Residents of peripheral or informal settlements participate less in OOH activities compared to central/well-off neighborhoods. This is evidenced by lower participation rates in social and recreational activities among residents of precarious neighborhoods, who also face higher instances of transport non-availability. Informal transportation systems emerge as critical in mitigating TRSE for these populations.
- H7: People living farther from their workplace are more dependent on public transport and participate less in OOH activities. Commuting distance significantly affects individuals' reliance on public transportation and their likelihood of missing or canceling activities. Distance is a key factor in public transport usage in daily life.

4.5. The Research Methodology

TRSE is an important and up-to-date subject both in developed and developing countries. Even though TRSE has been studied in many recent scientific contributions in North America, Europe, and Australia, the topic remains understudied in Sub-Saharan Africa. The complexity of this TRSE analysis is that different methods are presented in previous relevant literature, and no single method has been made consensus to evaluate TRSE. Some of the main studies are listed below:

Table 4.1. Measures used to identify TRSE in research studies

Authors	Site	TRSE Measures Used	Identified Disadvantaged
Cervero, R., and Golub, A. (2007)	Global, with examples from developing countries	Informal transportation modes, accessibility, affordability, regulatory environment	Low-income earners, residents of informal settlements
Porter, G. et al. (2013)	Rural Tanzania	Mobility challenges, walking distances, transport costs	The elderly, those with limited physical mobility
Salon, D., and Gulyani, S. (2010)	Nairobi, Kenya	Travel behavior, transport choice, transport costs	Women, low-income earners, slum dwellers
Lucas, K. (2011)	Tshwane Region, South Africa	Transport access, cost, reliability, employment, healthcare access, social networks	Low-income populations in peri-urban and rural areas
Venter, C. et al. (2007)	Durban, South Africa	Gender, residential location, access to employment and services	Women from low-income households in areas with poor transport connectivity
Adeel, M. et al. (2016)	Rawalpindi and Islamabad, Pakistan	Transportation disadvantages, participation in activities, access, cost, travel time	Residents with low incomes, women, and areas with poor public transport services
Lucas, K. (2012)	General overview, not site-specific	Accessibility to services, employment opportunities; affordability and availability of public transport	Low-income individuals, people with disabilities, the elderly
Martens, K. (2017)	Theoretical framework with examples from multiple sites	Distribution of transport resources; accessibility to essential services; participatory involvement in transport planning	Marginalized communities, including ethnic minorities and low-income households
Currie, G., and Delbosc, A. (2010)	Urban areas, not site-specific	Psychological impacts of transport disadvantage; physical accessibility to transport; perceived quality of transport services	Young people, the elderly, people with mental health issues
Preston, J., and Rajé, F. (2007)	UK, urban, and rural areas	Physical accessibility to transport, mobility opportunities, affordability, temporal availability of transport services	Rural residents, the elderly, those without access to a car
Sen, A. (2000)	Conceptual paper, not site-specific	Theoretical discussion on capabilities and access to resources, including transport	Broadly applicable to any group facing exclusion

Table 4.1. (continued) Measures used to identify TRSE in research studies

Authors	Site	TRSE Measures Used	Identified Disadvantaged
Dodson, J., and Sipe, N. (2007)	Urban fringe areas of Australian cities	Distance to public transport services, frequency, car dependency, affordability	Urban fringe residents, particularly low-income or without car access
Farrington, J., and Farrington, C. (2005)	Rural Scotland	Accessibility to services and social networks, quality and reliability of transport services, integration of transport modes	Rural populations, especially the elderly and young people without access to private transport

4.5.1. Measuring TRSE in Abidjan

Despite various methods proposed in the literature to measure TRSE, there seems to be no consensus about a unique method. Measuring TRSE in a city like Abidjan requires a comprehensive approach that considers the multifaceted nature of social exclusion and the specific urban and socio-economic context of Abidjan. Acknowledging this multifaceted nature of TRSE, this study adopts a mixed-methods approach, integrating quantitative (survey questionnaires) and qualitative (interviews) research methods to provide a comprehensive understanding of how transport accessibility affects social exclusion. This approach allows for a robust analysis of TRSE, combining the generalizability of quantitative data with the depth and nuance of qualitative insights.

In a context characterized by a lack of data, such as Abidjan, this methodology emerges as the most effective approach. Numerous scholars have employed this method to assess Transportation-Related Social Exclusion (TRSE) within the comparative frameworks of developing countries (Adeel et al., 2016; Venter et al., 2007; Lucas, 2011; Salon and Gulyani, 2010).

Our study assesses the extent of social exclusion by examining the participation in daily activities as reported by residents of Abidjan, utilizing primary data collected from questionnaire surveys conducted at ten distinct sites throughout the city. We explored the impact of various transportation-related factors on individual activity participation, employing a range of statistical tests and regression analyses to illuminate the effects of accessibility and mobility issues.

In addressing the complex and somewhat subjective notions of transportation disadvantage and social exclusion, this thesis prioritizes simplicity and clarity in its data analysis and

modeling approach. The scarcity of existing research within the African context, coupled with a notable lack of comprehensive data, necessitated an initial focus on foundational analysis of the issue at hand.

A Household Survey on Transport Demand (EDT), conducted by the National Institute of Statistics (INS) across a sample of 20,000 households, proved invaluable in our exploration of TRSE dynamics within Abidjan. However, this survey, conducted in 2013, presented limitations for a detailed investigation of the intricate relationship between transportation disadvantage and social exclusion in the context of 2024. Consequently, the decision was made to adopt a small-scale sample size for our questionnaire surveys on activity participation, a choice dictated by both time and budgetary constraints.

4.5.2. Research design

The mixed-methods research design is chosen to explore the complexities of TRSE in Abidjan. This design facilitates a broad understanding of transportation issues from a statistical perspective and offers a deep dive into personal experiences and perceptions that underlie statistical trends. The study sequentially integrates the findings from quantitative surveys with qualitative interviews and focus groups, enabling a comprehensive analysis of TRSE.

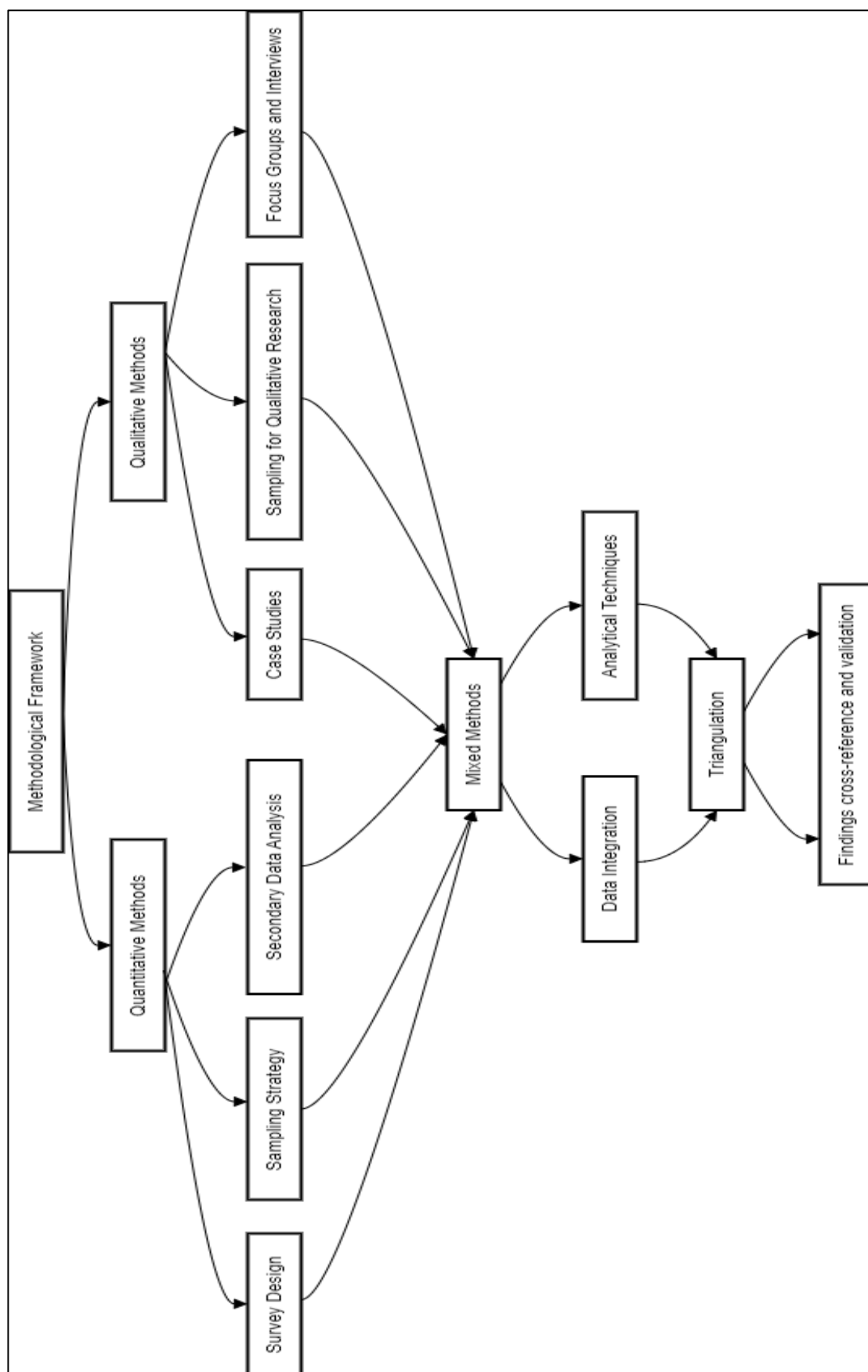


Figure 4.1. Methodological framework

4.5.3. Quantitative methods

Survey design

Population and sampling: The target population includes residents of Abidjan aged 18 and above, with a stratified sample reflecting the city's diverse socio-economic and demographic characteristics. The sample size is determined to be 402 respondents, calculated to achieve a confidence level of 95% with a margin of error of 5%, ensuring the results are statistically significant and representative of the population. The research was methodical and stratified by random sampling of selected individuals from varied neighborhoods and income ranges for representation and diversity. Participants were randomly recruited from each stratum and took into account Abidjan's gender and social dynamics. Random selection ensured that all population members had an equal chance of being selected.

Survey instrument: The questionnaire comprises sections on demographic information, access to transport, transport affordability, transport availability, transport acceptability, and the impact of transport on daily activities. Likert scale questions, multiple-choice questions, and open-ended questions are utilized to capture a range of data. By using a standardized questionnaire, the researcher collected quantitative data from a representative sample of Abidjanians. The questionnaires were also carefully designed to gather quantitative data on demographics, travel habits, gender, and social exclusion. The questionnaire is given in the Appendices Section. Throughout closed and open-ended questions, the survey asked the following:

- Geo-demographic details of the respondent such as residential address, age, gender, main activity, and level of education;
- Socio-economic situation such as possession and number of vehicles and houses (MV, 1V, 0VO, 0VR), belonging to group of vulnerable people (women, disabled, elderly, poor ...), type of neighborhood (Slums, Poor, Mixed, Residential, Well-off) and distance from workplace ([0-500m[, [500m-1500m[, [1500m-5km[, [5km-15km[, [15km-35km]);
- OOH activities participation (Daily, Twice a week, Weekly, Twice a month, Monthly, Occasionally) and means of transport (Walk, Bicycle, Motorcycle, Car, Public transport, Gbaka, Woro-woro, Taxi);

- Cancellation regularity (Never, Rarely, Sometimes, Often, Very often) of OOH activities (education, work, religious, entertainment, health care, shopping, social activities, cultural and political events) and the reason behind these cancellations (Quality of public transport, Non-availability of personal transport, Fuel/CNG shortage, Political situation like strikes, Cost of travel/fuel, Non-availability of escort or permission from house, Non-availability of public transport, Other issues);
- Ranking of some transportation issues (Cost of travel, Distance to stop from residence, Indirect access to destination, Waiting time in transport, Availability at night, Discomfort during travel, Waiting time at stop, Availability of seat).

Data collection

Surveys are distributed through a combination of face-to-face interviews and paper questionnaires, reaching participants across different areas of Abidjan. Distributed in the 14 communes of Abidjan and its suburbs with a sample of 402 individuals, this multimodal approach of survey ensures high response rates and inclusivity. A selection of 10 participants were interviewed in semi-structured interviews. These interviews illuminated participants' particular limits, obstacles, and perceptions of TRSE. These interviews added context and fascinating narratives to the quantitative data.

Table 4.2. Repartition of questionnaires and interviews according to commune and period

No.	Name of Commune	Number of questionnaires		Number of interviews	
		1st wave Dec 2020	2nd wave July 2021	1st wave Dec 2020	2nd wave July 2021
1	Abobo	19	7		
2	Attécoubé	12	5		
	Anyama	7	13		
3	Yopougon	18	11		
4	Adjame	29	42	2	1
5	Plateau	25	13	3	1
6	Cocody	22	31		
	Koumassi	13	8		
7	Marcory	7	9		
	Treichville	9	14	1	
	Port-Bouet	8	13		
8	Grand-Bassam	4	16		1
9	Bingerville	15	11		1
10	Songon	13	8		
	Total	201	201	6	4

This survey was conducted in two waves (402 questionnaires) and each wave covered half of the sample (201 questionnaires) from 10 mixed sites across the city. The first wave was

carried out in December 2020. And the second wave was done in July 2021. The two-wave approach was chosen to account for seasonality and minimize the climate effects on the study. The survey was unaffected by the Coronavirus Pandemic (COVID-19), as the government, through its decision to ease restrictive measures post-July 2020, permitted populations and businesses to largely resume their activities in a near-normal manner.



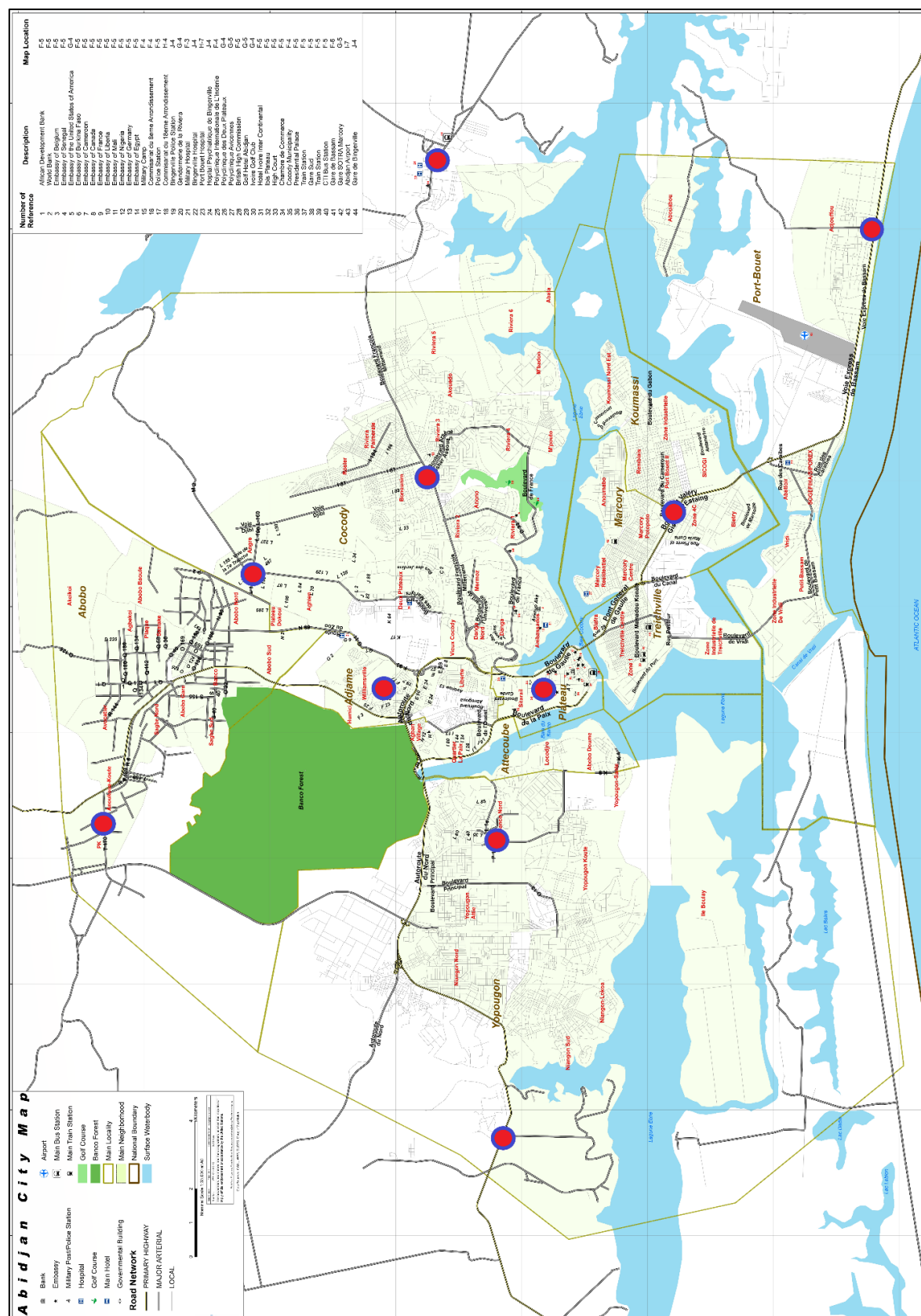


Figure 4.2. Map of the ten sites of survey across the city

By using this mixed-methods approach, including a structured survey questionnaire and semi-structured interviews, this comprehensive methodology gave the study a complete grasp of daily travel, activity participation, and social exclusion in Abidjan. It permitted quantitative and qualitative investigation of statistical trends, human experiences, perspectives, and obstacles. The quantitative part provided numerical data to identify patterns and trends, while the qualitative part explored individuals' personal stories and lived experiences to illuminate their transportation challenges and their level of social inclusion. The mix of approaches enabled a more rigorous and complete analysis. The survey questionnaire semi-structured interview questions and expected insights are listed in the appendices.

Data analysis

Data from the surveys were digitized and analyzed using SPSS or a similar statistical software package to analyze the survey data. To measure the main TRSE trends in the city, clustering, frequency, mean, weighted average, and median were analyzed according to their capability to highlight each hypothesis. Descriptive statistics provide an overview of the data, while inferential statistics test hypotheses related to TRSE factors, such as chi-square tests and logistic regression, to identify relationships between demographic factors and TRSE.

4.5.4. Qualitative methods

Key informant interviews

Selection: Ten (10) key informants, including city planners, transport officials, NGO representatives, and community leaders, are interviewed to gain expert insights into Abidjan's transportation system and policies. Interviews took into account Abidjan's gender and social dynamics and allowed qualitative investigation of people's experiences, viewpoints, and narratives.

Procedure: One-on-one interviews are conducted, lasting between 45-60 minutes, using a semi-structured interview format to explore informants' perspectives on TRSE and potential policy solutions. Discussions are guided by a semi-structured interview guide, which

includes prompts on personal experiences with public transport, perceived barriers to mobility, professional analyses, and suggestions for improving transport inclusivity.

Data analysis

Qualitative data from interviews are transcribed verbatim and analyzed using thematic analysis. This involves the data into themes that emerge from the participants' discussions, to facilitate the organization and analysis of qualitative data. The key informant interviews added context and fascinating narratives to the quantitative data. These interviews illuminated the survey participants' limits, obstacles, and perceptions of TRSE.

4.5.5. Triangulation of findings

This study employs triangulation to validate and deepen the understanding of TRSE in Abidjan. By integrating quantitative survey data with qualitative insights from focus groups and interviews, the research presents a multifaceted view of the transport challenges faced by residents of Abidjan. The combination of quantitative and qualitative methods enables the study to not only measure the prevalence and characteristics of TRSE but also to understand the lived experiences of individuals affected by it, providing a solid foundation for developing targeted interventions.

Table 4.3. Data sources and collection details

Data/Information	Sample	Source
General information on transport, accessibility, and social exclusion	Unlimited	Academic literature review
Transportation trends and accessibility patterns in Abidjan	Unlimited	National Institute of Statistics, Municipalities, International Partners
Transportation issues and challenges in Abidjan by resource persons	10	Interviews by the author
Individual's personal stories and lived experiences	10	Semi-structured interviews by the author
Direct survey in the Greater Abidjan Area	402	Questionnaire by the author

4.5.6. Ethical considerations

Informed consent is sought from all participants, ensuring they are aware of the study's purpose and their rights. Anonymity and confidentiality of responses are guaranteed. To all respondents, the aim of the research has been explained before asking their willingness to

participate in the survey. They have been told that the survey participation is completely voluntary and they may stop responding at any time during the process. Respondents have been given insurance that their information will be kept anonymous and their data will solely be utilized for educational purposes.





5. RESEARCH FINDINGS AND DISCUSSION

5.1. Demographic Profile of the Respondents

Before investigating the study objectives, an initial analysis was performed on the demographic details of the respondents including gender, age, level of education, and monthly income.

Table 5.1. Frequency of demographic details of interviewees

Demographic information		Frequency	Percentage
Age	10-19	33	8.2
	20-29	97	24.1
	30-39	96	23.9
	40-49	98	24.4
	50-59	28	7.0
	>=60	41	10.2
	not declared	9	2.2
Gender	Male	240	59.7
	Female	162	40.3
Level of education	University	192	47.8
	High school	80	19.9
	Primary	43	10.7
	Illiterate	87	21.6
Monthly income	less than 200 USD	112	27.9
	between 200 and 400 USD	100	24.9
	between 400 and 800 USD	96	23.9
	between 800 and 1600 USD	59	14.7
	1600 USD and above	35	8.7

5.1.1. Gender and age

All the respondents were aged between 10 to above 60 years. The age distribution of the respondents indicates that 33 (8.2%) respondents were from the age group 10-19 years, 97 (24.1%) were between 20-29 years, 96 (23.9%) were between 30-39 years, 98 (24.4%) were from 40-49 years old, 28 (7.0%) were from 50-59 years old and 41 (10.2%) were above 60 years old.

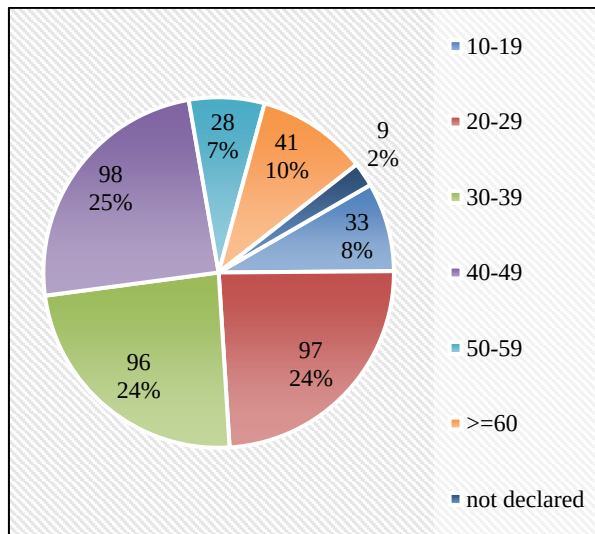


Figure 5.1. Age distribution

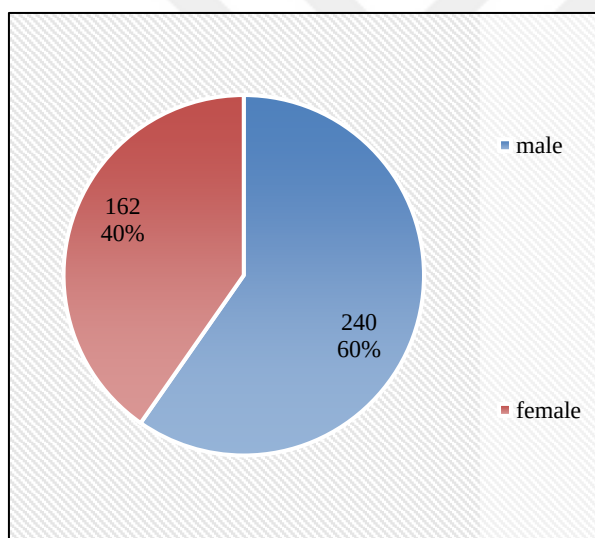


Figure 5.2. Gender distribution

Regarding the gender distribution, the majority of respondents i.e., 240 (59.7%) were male while 162 (40.3%) were females.

The findings in the figure below indicate that, based on the distribution of ages, a higher percentage of respondents were aged between 40-49 years, accounting for 24.4% of both men and women.

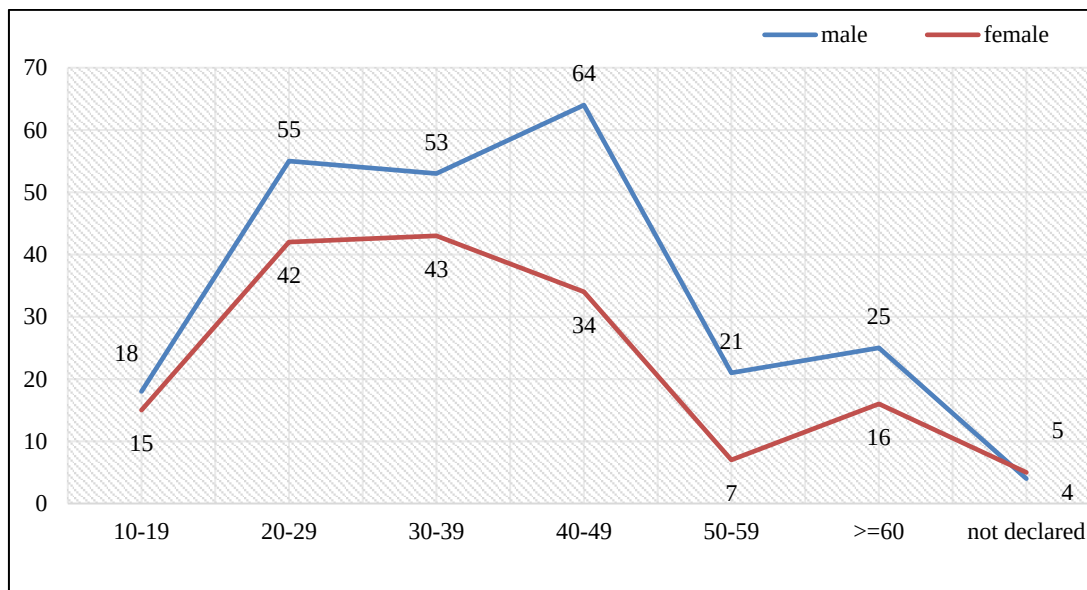


Figure 5.3. Gendered profile according to the age of the respondents

However, women (34) are less represented than men (64); followed by 20-29 years, accounting for 24.1%, 30-39 years, accounting for 23.9%, and those aged 60 years and above accounted for 10.2%. The lowest number of respondents were those aged 50-59 years with 7%, and 10-19 years with 8.2%.

Based on the results, most of the respondents are at the middle age and are actively using transportation to various places of their work, recreation activities, and schooling, among others.

5.1.2. Level of education

The level of education shows that the majority of the respondents, 192 (47.8%) had completed university education, followed by 80 (19.9%) who had completed high school, 43 (10.7%) completed primary education and 87 (21.6%) were illiterate. From the cross-analysis, university qualifications had the highest number of respondents, with 192 translating to 47.8%, with males recording the highest number (134) of respondents than females (58). This was followed by the illiterate respondents, with 87 respondents attributing to 21.6%, with males recording the highest population (48) than that of females (39).

Table 5.2. Distribution of education level vs. gender vs. age

Age	What is your level of education?	Male	% Male	Female	% Female
10-19	High school	16	4.0%	13	3.2%
	Illiterate			1	0.2%
	University	2	0.5%	1	0.2%
20-29	High school	21	5.2%	19	4.7%
	Illiterate	6	1.5%	4	1.0%
	Primary	4	1.0%	9	2.2%
	University	24	6.0%	10	2.5%
30-39	High school	6	1.5%		
	Illiterate	12	3.0%	11	2.7%
	Primary	4	1.0%	15	3.7%
	University	31	7.7%	17	4.2%
40-49	High school	3	0.7%		
	Illiterate	7	1.7%	10	2.5%
	Primary	2	0.5%	4	1.0%
	University	52	12.9%	20	5.0%
50-59	Illiterate	3	0.7%		
	Primary	1	0.2%		
	University	17	4.2%	7	1.7%
>=60	Illiterate	18	4.5%	13	3.2%
	University	7	1.7%	3	0.7%
	High school	1	0.2%	1	0.2%
not declared	Illiterate	2	0.5%		
	Primary			4	1.0%
	University	1	0.2%		

High school respondents accounted for 80 respondents (19.9%), with those in primary level as their highest level of education, recording the lowest number of respondents, with 43 translating to 10.7%. The findings are presented in the figure.

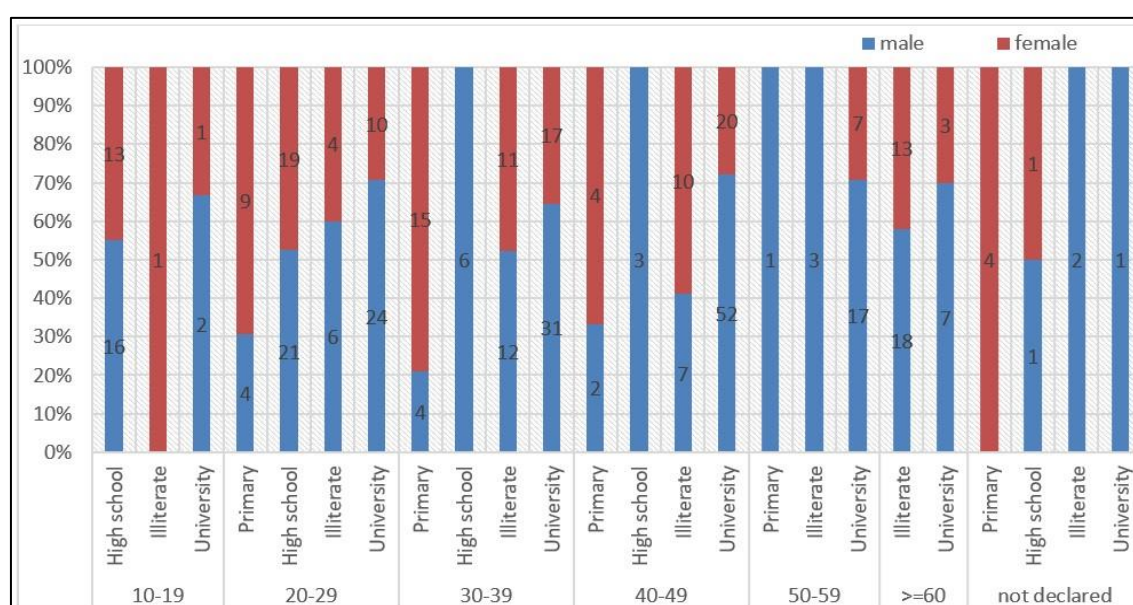


Figure 5.4. Graphic for education level vs. gender vs. age

5.1.3. Monthly income

The monthly income shows that 112 (27.9%) had an income less than 200 USD, 100 (24.9%) were earning between 200 and 400 USD, 96 (23.9%) were earning between 400 and 800 USD, 59 (14.7%) had a monthly income between 800 and 1600 USD and 35 (8.7%) were earning more than 1600 USD.

Table 5.3. Distribution of income vs. gender vs. age

Age	Gender	less than 200 USD		Between 200 and 400 USD		between 400 and 800 USD		between 800 and 1600 USD		1600 USD and above	
		#	%	#	%	#	%	#	%	#	%
10-19	Male			2	0.50%	14	3.48%	2	0.50%		
	female			1	0.25%	12	2.99%	2	0.50%		
20-29	Male	10	2.49%	14	3.48%	19	4.73%	10	2.49%	2	0.50%
	female	6	1.49%	11	2.74%	15	3.73%	9	2.24%	1	0.25%
30-39	Male	8	1.99%	11	2.74%	13	3.23%	11	2.74%	10	2.49%
	female	19	4.73%	11	2.74%	5	1.24%	6	1.49%	2	0.50%
40-49	Male	14	3.48%	29	7.21%	5	1.24%	8	1.99%	8	1.99%
	female	20	4.98%	6	1.49%	2	0.50%	3	0.75%	3	0.75%
50-59	Male	3	0.75%	7	1.74%	3	0.75%	4	1.00%	4	1.00%
	female			1	0.25%	2	0.50%			4	1.00%
>=60	Male	15	3.73%	4	1.00%	4	1.00%	1	0.25%	1	0.25%
	female	12	2.99%	3	0.75%	1	0.25%				
Not declared	Male	1	0.25%			1	0.25%	2	0.50%		
	female	4	1.00%					1	0.25%		

The Elderly (60 years and above) are affected by income (27) probably due to their age. By contrast, the majority of those earning less than 200 USD were aged between 40-49 years, accounting for 34 for both men and women. However, women remain the most affected within this group of age (20) compared to men.

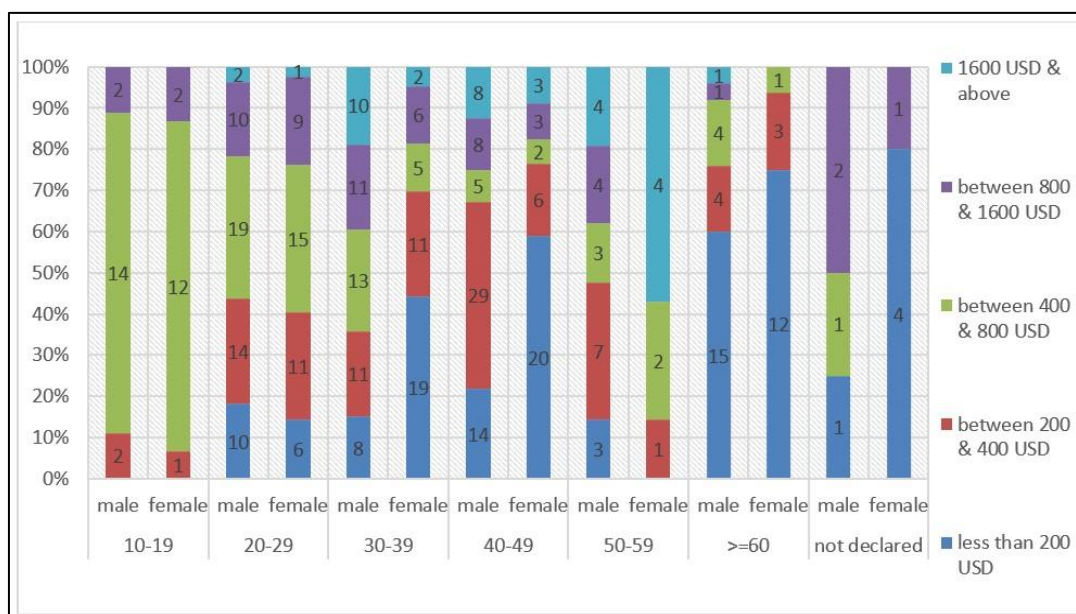


Figure 5.5. Graphic for income vs. gender vs. age

5.2. Socioeconomic Characteristics

Socio-economic factors comprise household and vehicle ownership, belonging to vulnerable people, type of inhabited neighborhood, and distance from home to workplace.

Table 5.4. Frequency of socioeconomic details of interviewees

Socio-economic factors		Frequency	Percentage
Household and vehicle ownership	Multiple Vehicles - MV	25	6.2
	1 Vehicle -1V	76	18.9
	0 Vehicle - Owner housing -0VO	103	25.6
	0 Vehicle - Rent housing -0VR	198	49.3
	Elderly	50	12.4
Belonging to vulnerable people	Disables	12	3.0
	Women	111	27.6
	Poor	67	16.7
	Children	5	1.2
	not declared	157	39.1
Type of inhabited neighborhood	Slums	89	22.1
	Poor	70	17.4
	Mixed	171	42.5
	Residential	63	15.7
	well-off	7	1.7
Distance from home to workplace	not declared	2	.5
	0-0,5km	43	10.7
	0,5-1,5km	108	26.9
	1,5-5km	103	25.6
	5-15km	94	23.4
	15-35km	40	10.0
	not declared	14	3.5

5.2.1. Household and vehicle ownership

Household and vehicle ownership indicate that 25 (6.2%) respondents owned multiple vehicles, 76 (18.9%) owned 1 vehicle, 103 (25.6%) had no vehicle and owned a house, and 198 (49.3%) had no vehicle and were renting a house.

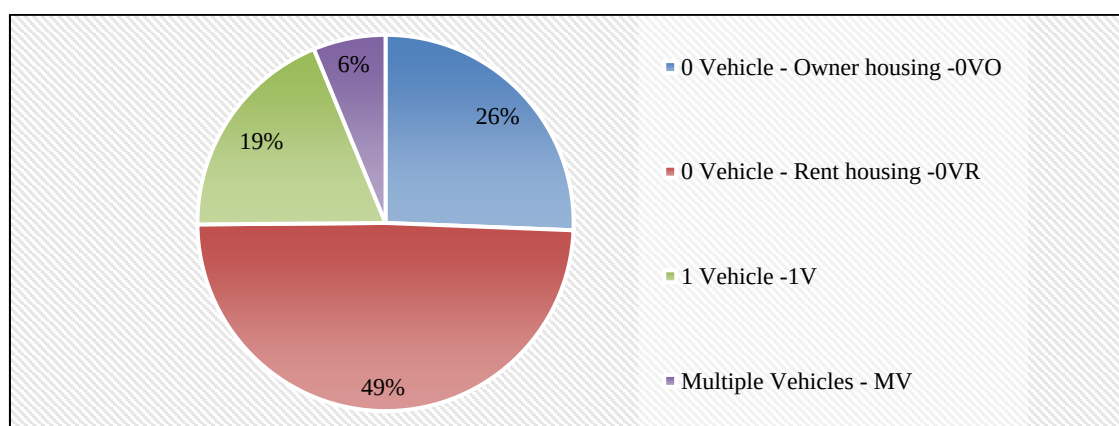


Figure 5.6. Graphic for household and vehicle ownership

5.2.2. Belonging to vulnerable people

Moreover, the respondents were asked if they belonged to any of the vulnerable people. 50 (12.4%) respondents belonged to elderly people, 12 (3.0%) belonged to disables, 111 (27.6%) to women, 67 (16.7%) to poor people, 5 (1.2%) to children and 157 (39.1%) did not declare their belonging to any vulnerable people.

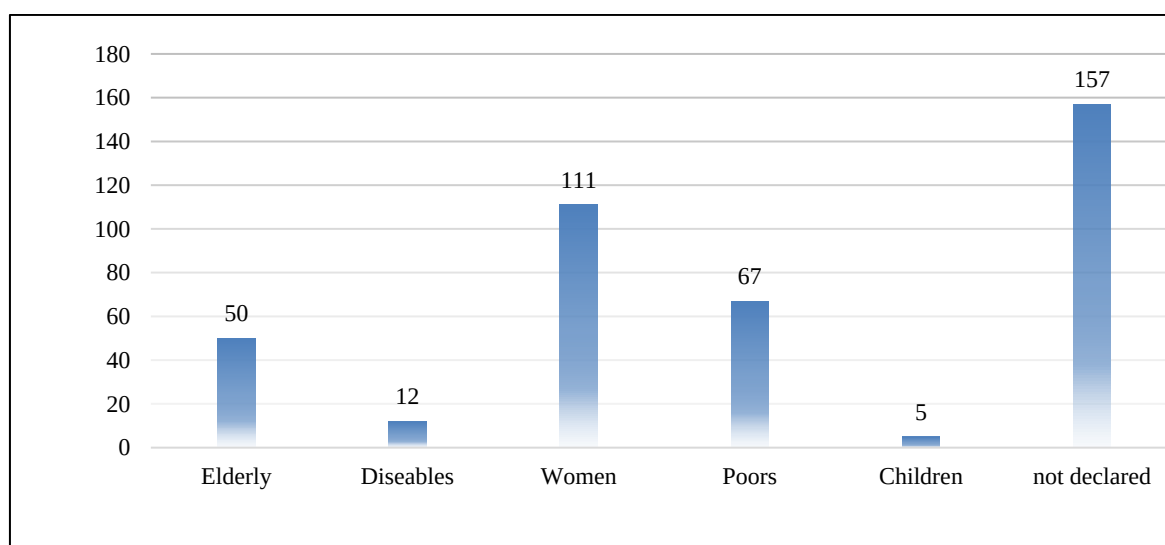


Figure 5.7. Graphic for belonging to vulnerable people

5.2.3. Type of inhabited neighborhood

Considering the type of inhabited neighborhood, 89 (22.1%) live in slums, 70 (17.4%) had a poor neighborhood, 171 (42.3%) had a mixed neighborhood, 63 (15.7%) had residential, 7 (1.7%) had well-off neighborhood and 2 (0.5%) did not declare any details about their neighborhoods.

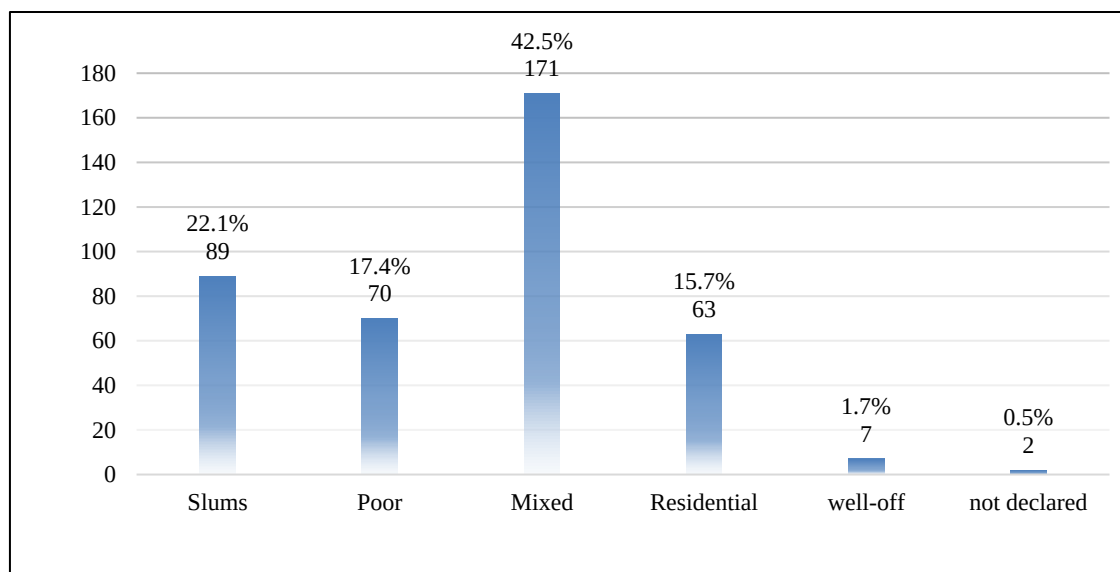


Figure 5.8. Graphic for inhabited neighborhood

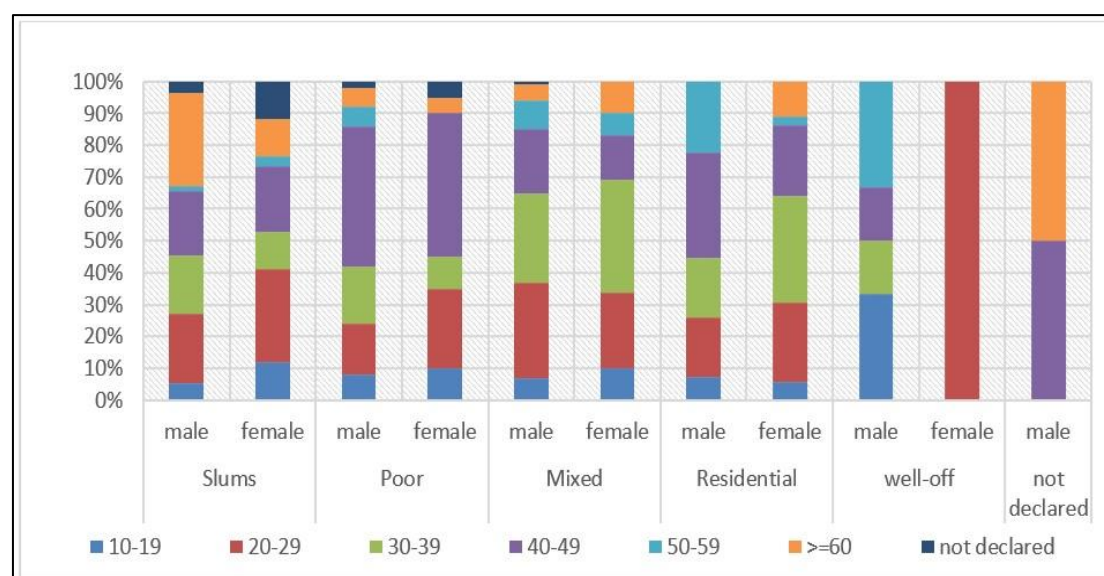


Figure 5.9. Graphic analysis for neighbourhood vs. gender vs. age

5.2.4. Distance from home to workplace

The distance of the participants from their home to workplace shows that 43 (10.7%) had to travel only 0-0.5km, 108 (26.9%) had a distance of 0.5-1.5km, 103 (25.6%) had to travel from 1.5-5.0 km, 94 (23.4%) had to travel between 5-15 km, 40 (10.0%) answered 15-35 km. 14 (3.5%) respondents did not declare the distance from home to workplace.

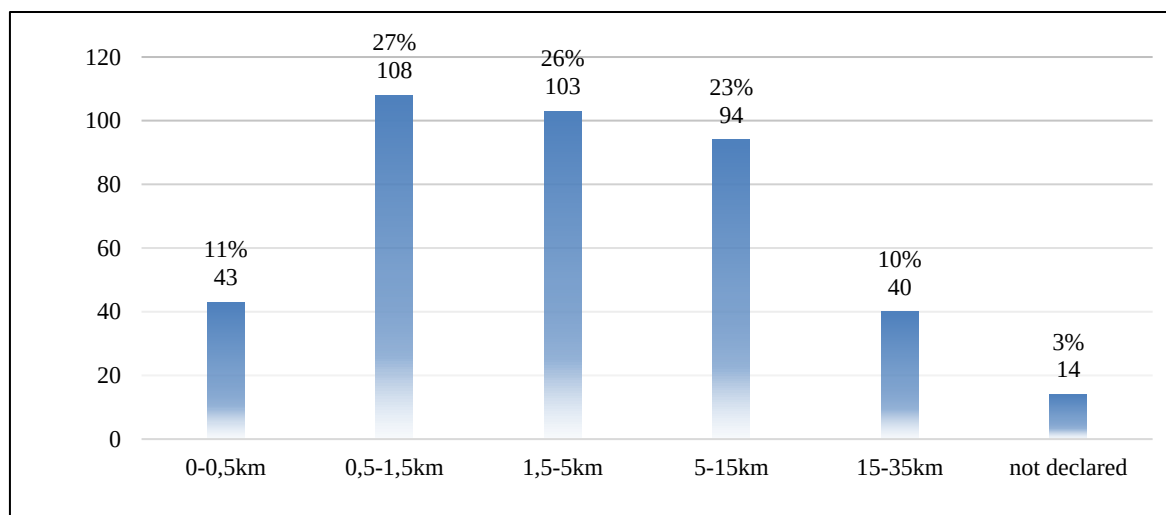


Figure 5.10. Graphic for distance from home to workplace

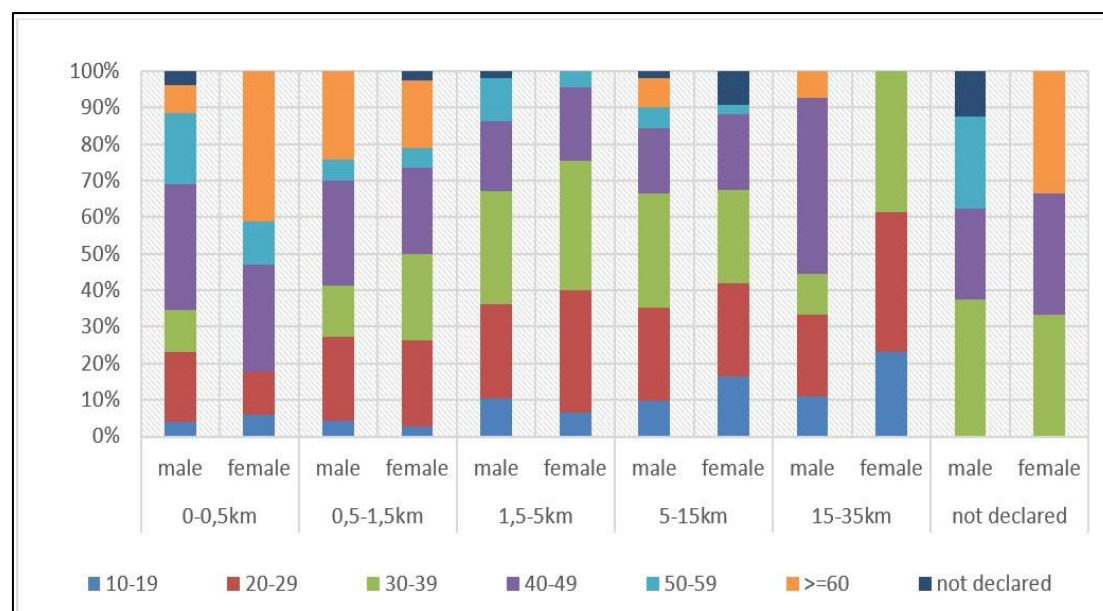


Figure 5.11. Graphic analysis according to distance vs. gender vs. age

5.3. Regression Analysis

In the model presented in the table below in the appendix, the value of (R) is 0.728, which is a value showing the presence of shared variance between independent and dependent variables. The R-squared is a model that is used to measure the model goodness-of-fit. From the analysis, the value of the R-squared was 0.529 with an adjusted R-square of 0.4661 inferring that 52.9% of the relationship is explained by the variables under the study. This means that other factors not considered in this study contributed to 47.1% of the dependent variable variance.

5.4. The Analysis of Variance

The ANOVA was used to examine the significance of the model in the study. During the significance interval test, a P-value of 0.05 or less is considered to be statistically significant. From the analysis, the model has a p-value of 0.000 which is a value less than the minimum threshold of 0.05. This, therefore, means that the model was statistically significant in predicting the factors affecting women exclusion in the transportation sector in Abidjan at a 95% level of confidence interval, the analysis indicated a relatively high reliability of the results obtained from the study. The ANOVA findings, therefore, indicated that the regression model was significant at F (representing a test of the null hypothesis) = 7.723, $p = 0.000$.

5.5. Reliability Analysis

To assess the internal consistency and reliability of each question in the data set, Cronbach's Alpha was utilized. Cronbach's Alpha is used to figure out whether or not items across various scales converge. According to Gliem and Gliem (2016), a number greater than .7 is acceptable and dependable. To ensure that all our survey questions were reliable, six variables were separately tested: frequency of participation in OOH activities, mode of access to OOH activities, transport service ranking, issues reducing access, reason for activities missing/canceled, and frequency of events missing. Results show that all the variables except the frequency of participation in OOH activities are reliable.

Table 5.5. Cronbach's Alpha analysis

Variables	Cronbach's Alpha	No. of items
Frequency of participation in OOH activities	0.524	9
Mode of access to OOH activities	0.734	9
Transport service ranking	0.836	8
Issues reducing access to transport	0.708	7
Reason for activity cancellation	0.754	8
Frequency of missing events	0.844	9

5.6. Hypotheses Testing

This study aims to assess the issue of TRSE and its role in daily mobility and activity participation in developing countries. It analyses the relationship between public transportation dynamics and individuals' perceptions of social exclusion. To achieve this aim, various hypotheses were tested in this section.

5.6.1. H1 - The frequency of women's participation in OOH activities is significantly lower than that of men

This suggests that women's mobility and social inclusion in Abidjan are influenced by transportation access, framing it as a critical gendered issue.

Gender influences transport accessibility and the frequency of activity participation. In this hypothesis, the aim is to see if gender has any impact on the frequency of OOH activities. By testing this hypothesis, the aim is to assess whether women have a lower frequency of OOH activity participation than men.

Table 5.6. Relationship between gender and OOH activities participation

Activities	Male	Female	p-value
Work			
Daily	142	91	
Alternate day	21	10	
Twice weekly	21	14	0.365
Weekly	15	7	
Twice a month	2	5	
Monthly	3	5	
Occasionally	6	6	
Education			
Daily	38	24	
Alternate day	9	3	

Table 5.6. (continued) Relationship between gender and OOH activities participation

Activities	Male	Female	p-value
Twice weekly	6	4	0.192
Weekly	1	0	
Twice a month	0	2	
Monthly	0	2	
Occasionally	5	6	
Religious			
Daily	101	0	0.000
Alternate day	29	4	
Twice weekly	51	35	
Weekly	45	35	
Twice a month	2	11	
Monthly	0	22	0.000
Occasionally	2	46	
Recreational			
Daily	15	1	
Alternate day	14	4	
Twice weekly	44	10	
Weekly	64	37	0.020
Twice a month	17	12	
Monthly	12	11	
Occasionally	46	58	
Healthcare			
Daily	1	0	0.305
Alternate day	3	9	
Twice weekly	12	9	
Weekly	13	7	
Twice a month	23	30	
Monthly	87	44	0.044
Occasionally	76	57	
Shopping			
Daily	3	0	
Alternate day	6	7	
Twice weekly	12	10	
Weekly	16	15	0.175
Twice a month	22	11	
Monthly	61	32	
Occasionally	92	74	
Socializing			
Daily	5	0	0.175
Alternate day	10	4	
Twice weekly	13	4	
Weekly	12	10	
Twice a month	48	25	
Monthly	36	40	0.175
Occasionally	76	62	
Cultural events			
Daily	1	0	
Alternate day	7	4	
Twice weekly	9	2	
Weekly	8	9	0.175
Twice a month	29	29	
Monthly	40	20	
Occasionally	101	81	
Political events			

Table 5.6. (continued) Relationship between gender and OOH activities participation

Activities	Male	Female	p-value
Daily	3	0	0.087
Alternate day	3	3	
Twice weekly	9	4	
Weekly	9	2	
Twice a month	21	8	
Monthly	20	13	
Occasionally	87	82	

The cross-tabulation results show that there exists no relationship between gender and OOH activities i.e., work ($p=0.365>0.050$), education ($0.192>0.050$), shopping ($0.305>0.050$), cultural events ($0.175>0.050$) and political event ($0.087>0.050$). Contrary to this, there exists a statistically significant correlation between gender and religious activities ($p=0.000<0.050$), recreational ($0.000<0.050$), healthcare ($0.020<0.050$), and socializing ($0.044<0.050$). These results suggest that gender shapes OOH activities and transport behavior in the city. Both males and females displayed distinct patterns of OOH activity. That means gender is a crucial factor when considering OOH activities participation in Abidjan.

Gendered differences in frequency of OOH activity participation

Transport behavior differences have been well-documented in many previous studies. Due to gender-based differences in transport in Abidjan, as in many cities, men are expected to work first and foremost above other activities, resulting in unequal opportunities for women. In this way, men may receive work-related priority while women may face disadvantages in accessing job opportunities. Inequality between men and women persists due to this gendered division of labor. Compared to women, men have more time to devote to their careers and professions. Women tend to take on more unpaid household work and their ability to access resources including healthcare and education may be affected. This contributes to a lack of opportunity for women and perpetuates a cycle of inequality difficult to break (Bande and Kaplan, 2023).

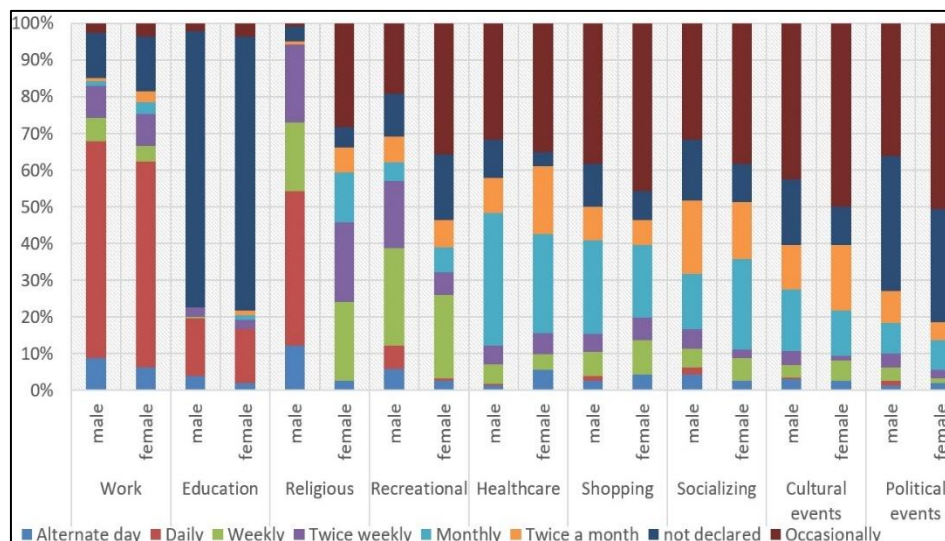


Figure 5.12. Frequency of activity-travel by gender

The figure shows that men travel more frequently for most OOH activities than women. Work and education activities were reported to require daily travel by 35.3% and 9.5% of men, respectively. As compared to 22.6% and 6.0% of women, respectively, this percentage is higher for men. Men reported traveling daily to religious activities in 25.1% of cases, but women indicated no such travel (0%). As for participating in social activities and recreational activities, 1.2% and 3.7% of men travel every day, respectively, while only 0.2% and 0% of women do.

However, women reported higher alternate-day shopping and healthcare trips (1.7% and 2.2%, respectively) compared to men (1.5% and 0.7%). These data suggest that men are more likely to engage in activities outside the home than women. In contrast, women are more likely to engage in shopping and healthcare activities. Overall, men travel more than women daily. This difference in behavior is possibly due to gender roles and expectations. Men are more likely to be the primary breadwinners of the family and expected to work outside the home. Women, on the other hand, are often expected to take care of the household and family members, and so are more likely to engage in shopping and healthcare trips.

As mentioned by Goel et al. (2022), the issue of limited access to public transportation restricts women's mobility and hinders their ability to participate in employment, education, healthcare, and other crucial activities (Goel et al., 2022). The findings supported the hypothesis that women have a lower frequency of OOH activity participation than men and use public transport less frequently. There is a gender-based difference in access to public

transport, and women are more likely to face exclusion in public transportation (Bande and Kaplan, 2023).

Issues to access public transport by gender

In addition, an independent sample t-test was carried out to assess if there are any differences between females and males in transportation issues reducing their access to activities. The results confirm that there is no significant statistical difference between males and females for access to events like jobs ($p=0.463>0.050$), education ($0.241>0.050$), religious ($0.833>0.050$), recreational/sport ($0.559>0.050$), healthcare ($0.152>0.050$), shopping ($0.130>0.050$) and socializing ($0.185>0.050$).

Table 5.7. Gender t-test on issues reducing access to activities

Issues	Gender	N	Mean	Std. Deviation	p-value
Job/Income	male	192	2.2604	1.07074	.463
	female	113	2.3717	1.38354	
Education	male	74	2.4324	1.30417	.241
	female	42	2.7143	1.11061	
Religious	male	217	2.1382	1.33308	.833
	female	148	2.1081	1.34587	
Recreational/sport	male	211	2.4455	1.16317	.559
	female	128	2.5234	1.22933	
Healthcare	male	227	2.5154	1.23140	.152
	female	144	2.3264	1.24502	
Shopping	male	224	2.6964	1.13911	.130
	female	142	2.8803	1.11395	
Socializing	male	200	2.7500	1.22679	.185
	female	138	2.9348	1.30248	

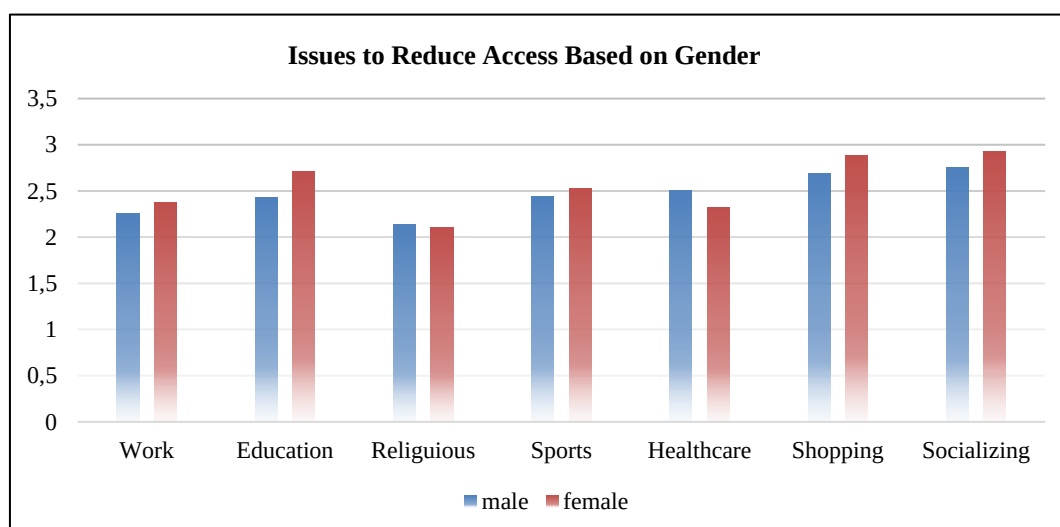


Figure 5.13. Issues reducing access to activities based on gender

Bande and Kaplan, (2023) stated that public transport can be unreliable, overcrowded, and unsafe in developing cities. It can also be expensive, with fares increasing faster than inflation. Additionally, public transport is not always available in some peripheral areas, leaving residents with limited options. This research asked respondents to rank various issues (public transport quality, availability, cost...), on a scale of 1 to 5, representing the problem from lowest to highest concern. The results showed that cost was the highest concern, followed by availability and quality. This indicates that people are more concerned about public transport affordability than its availability and quality. This could be an indication that people are more likely to use public transportation if it is more affordable.

The results show that women report experiencing issues that limit their access to transportation to participate in OOH activities. Within the population, women have higher concerns regarding issues that reduce their accessibility to work, education, and social activities while men report lower concerns.

Not surprisingly, the figure shows 54.3 % of respondents expressed transportation costs as a major or extreme concern. Morisset (2019), the expense of the time spent on transport is one of the everyday difficulties of city life. When travel is sluggish and expensive, it is impossible to imagine an efficient and productive city. The poorest residents of Abidjan who rely on public transport spend 20% to 30% of their income on transportation and spend 200 minutes per day using or waiting for it. Moreover, Berrou et al. (2017) stated that the cost of daily trips made in the city accounts for more than 30% of the income of poor families.

Only 23.6 % of the population reported transport costs as a negligible or minor issue with public transportation. However, those who did not use public transportation reported transport costs as a minor concern, with some calling it a negligible issue. This indicates that public transportation is an affordable option for many people, despite their concerns.

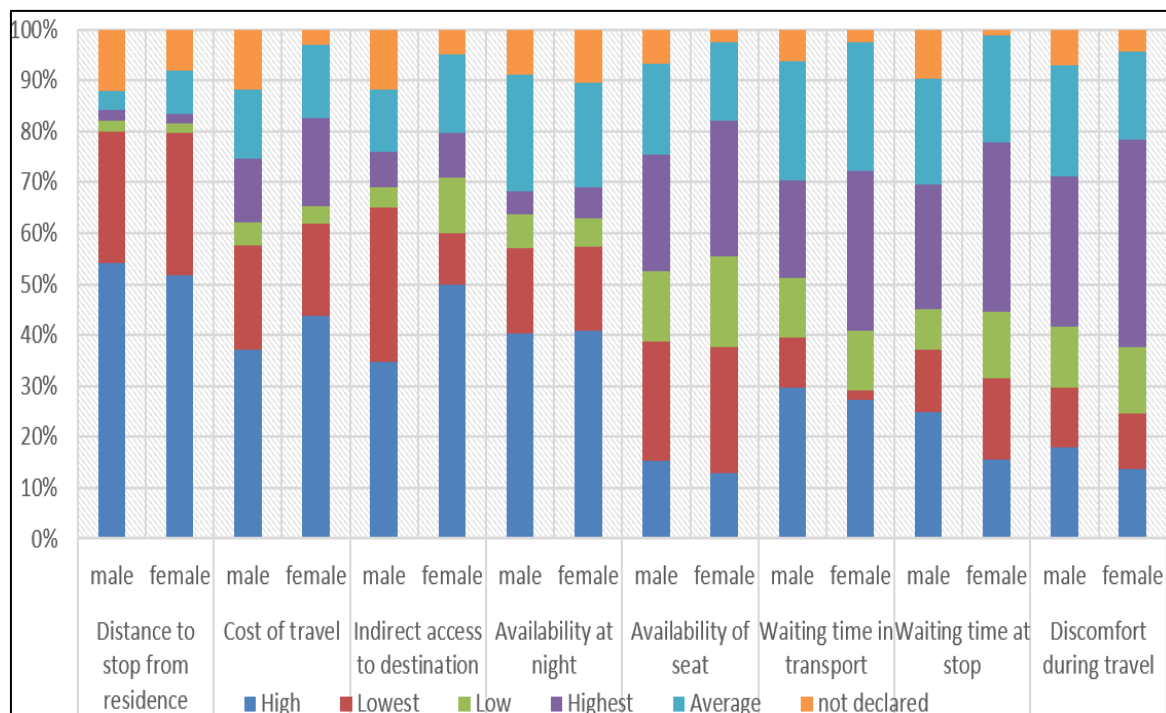


Figure 5.14. Ranking of issues reducing access to transport based on gender

The issues related to public transport availability (Distance to stop from residence, Indirect access to destination, and Availability at night) were identified as a higher concern specifically for women. Men ranked them as the lowest issue at 15.5%, 18.2%, and 10%, compared to women who ranked them at 11.2%, 4%, and 6.7% respectively. This difference in the ranking of public transport availability issues by gender indicates that women are more affected by these issues than men. Women feel these issues more acutely than men, likely because women tend to feel more vulnerable in public spaces, especially at night, which makes public transport availability an important factor in their everyday lives. This lack of access has had a significant negative impact on their quality of life. This has, in turn, led to lowered confidence, and reduced opportunities for personal and professional growth. Women are consequently at a disadvantage compared to men in many areas. According to Bande and Kaplan (2023), there is a need to improve public transport access for women in particular by increasing the number of stops, providing more direct routes to destinations, and ensuring availability during late hours.

Frequency of activity cancellation based on gender

Moreover, an independent sample t-test has been applied to see the difference between males and females regarding activity cancellation. The p-value associated with each comparison

gives us an indication of whether the differences notified are statistically insignificant or significant. If the p-value is below 0.05, this is generally accepted as an indication that there are significant differences between the studied groups. Here is how results breakdown:

- Work: The mean cancellation for men is higher than for women (1.6915 vs 1.4955). P-value=0.019 suggests that the difference is statistically significant, indicating that men have a higher frequency of canceling job-related activities than women.
- Education: The mean cancellation for men is lower than for women (1.9836 vs 2.5814). The P-value (0.021) indicates that the statistical difference is significant, suggesting that women cancel educational activities more often than men.
- Religious: The mean cancellation is roughly the same for both genders, with men slightly higher. The p-value (0.485) suggests the insignificant difference between genders in terms of canceling religious activities.
- Recreational: Women cancel more recreational activities than men, but this p-value (0.165) indicates that the difference is not statistically significant.
- Healthcare: Women have a slightly higher cancellation rate for healthcare activities than men, but this p-value of 0.462 suggests the difference is not significant statistically.
- Shopping: The mean cancellation for women is significantly higher than for men (2.8980 vs 2.5297) with a p-value of 0.001, which indicates that women cancel shopping activities more often than men.
- Socializing: Women cancel socializing activities significantly more often than men, as indicated by the p-value of 0.000.
- Cultural: Women also cancel cultural activities significantly more often than men, as indicated by the 0.000 p-value.
- Political: There is no significant difference between men and women in terms of canceling political activities, as suggested by the p-value of 0.749.

Table 5.8. Cancellation rate of activities based on gender

Activity cancellation	Gender	N	Mean	Std. Deviation	p-value
Work	male	188	1.6915	.76033	.019
	female	111	1.4955	.57007	
Education	male	61	1.9836	1.00816	.021
	female	43	2.5814	1.43481	
Religious	male	223	1.4843	.68344	.485
	female	152	1.4342	.67766	
Recreational	male	216	2.0231	1.08023	.165
	female	131	2.1985	1.22424	
Healthcare	male	220	2.0909	.93677	.462
	female	156	2.1731	1.14815	
Shopping	male	219	2.5297	.96393	.001
	female	147	2.8980	1.09002	
Socializing	male	211	2.3934	.94201	.000
	female	148	2.9122	1.11226	
Cultural	male	206	2.6650	1.02145	.000
	female	137	3.0949	1.19363	
Political	male	155	2.9161	1.16750	.749
	female	110	2.9636	1.21857	

The results show that there exists statistically significant difference between males and females regarding work ($p=0.019<0.050$), education ($0.021<0.050$), shopping ($0.001<0.050$), socializing ($0.000<0.050$) and cultural ($0.000<0.050$) while religious ($p=0.485>0.050$), recreational ($0.165>0.050$), healthcare ($0.462>0.050$) and political ($0.749>0.050$) does not differ by gender.

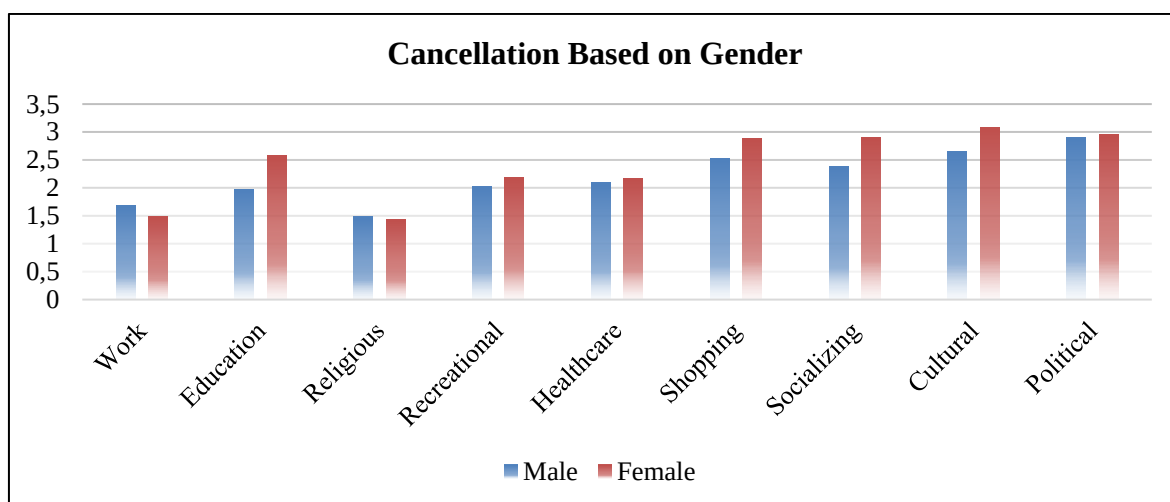


Figure 5.15. Activities cancellation rate based on gender

The results indicate statistically significant differences in activity cancellation between males and females in work-related activities (p-value of 0.019), education activities (p-value of 0.021), shopping activities (p-value of 0.001), socializing-associated activities (p-value of 0.000) and cultural events (p-value of 0.000). The most significant differences were found in socializing-associated activities and cultural events, where p-values were 0.000. This suggests an underlying reason why males and females cancel these activities at different rates.

Contrarily, the results indicate no statistically significant differences in activity cancellation between males and females in religious activities (p-value of 0.485), recreational activities (p-value of 0.165), healthcare (p-value of 0.462), and political events (p-value of 0.749). This suggests that there is no gender bias when canceling religious, recreational, healthcare, and political activities. Males and females are equally likely to cancel activities in these categories regardless of their gender.

These findings are particularly interesting because they suggest that gender is an influential factor in the decision-making process for work, education, shopping, socializing, and cultural activities' cancellation. Further research should be conducted to understand the underlying reasons for this gender-based discrepancy: why do males and females make such different decisions for these activities' cancellations? This could include a deeper analysis of gender social dynamics or interviews with those who canceled their activities. Understanding the nuances of this discrepancy phenomenon could help us better understand and predict transport behavior in similar scenarios. For Bande and Kaplan (2023), these findings could be used to reduce gender-based discrepancies, implement gender-sensitive decision-making policies, and create an equitable and inclusive environment.

The p-value indicates only that there is a statistically significant difference, not its size or direction. Taking into account the specific frequencies for males and females in each activity may enable us to determine which gender participates more often in each category.

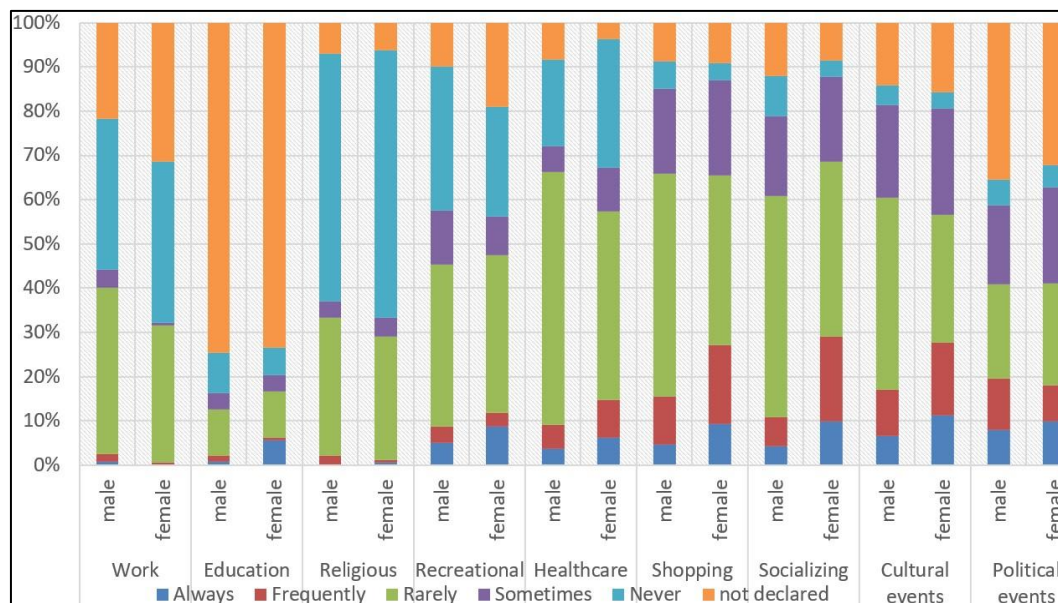


Figure 5.16. OOH activities cancellation based on gender

As shown in the figure above, women report canceling activities more often than men. Results show that women cancel "always" most of their activities (education, religious, recreational, healthcare, shopping, cultural, and socializing), except for work and political events. Interestingly, the discrepancy between the genders is most notable when it comes to "education", where women are 4.5 times more likely to "always" cancel their educational activities. There is a clear gender-based difference in the prioritization of educational activities, with women more likely to sacrifice their educational activities to take care of other responsibilities. This finding suggests a profound gender gap in educational engagement, which could adversely affect women's access to education, career advancement, and socioeconomic mobility.

In addition, women cancel more "frequently" healthcare, shopping, cultural, and socializing activities than men (socializing being the most frequently canceled activity, almost two times). This is likely due to women's increased responsibilities both in terms of family care and work. Women often have to juggle multiple tasks and prioritize certain ones over others, which can lead to more activity cancellations specifically leisure-related ones.

On the other hand, men tend to "rarely" cancel activities of any form (work, education, religious, recreational, healthcare, shopping, socializing, cultural, and political). Thus, men face fewer barriers to participating in different activities and have better access to transportation. However, this does not necessarily mean men are more active than women in

all of these domains, but rather they encounter fewer barriers or circumstances that require cancellation.

The results indicate a gender disparity in canceled activity frequency across different domains. These activities' cancellations and lack of transportation access affect both women's quality and quantity of activities and negatively impact their overall well-being. Women are more likely to face difficulties such as limited access to education, healthcare, employment opportunities, and social services. This can ultimately lead to gender inequality and women's social exclusion. Thus, providing safe and reliable transportation access for women is essential to create more equitable opportunities for them to participate in economic and social activities. Moreover, it can help promote gender equality and break down social exclusion barriers.

Choice of usual travel mode according to gender

Yeh and Chow, (1996) stated that walking is still the most common means of transport in developing nations, therefore having basic land uses nearby is critical for the community. The following figure illustrates how gender differs in transport mode choice depending on the type of activity. In Abidjan, walking appears to be the primary mode of transportation for all OOH activities, followed by Sotra transport. In terms of active travel, men were more likely to engage in this activity than women. Men reported walking 23.9% of the time to attend religious activities, and women reported walking 20.6% of the time. Women reported walking to their jobs only 14.2% of the time, while men reported walking 16.2% of the time. Additionally, 18.4% of men and 15.2% of women reported walking to recreational activities. Furthermore, 6% of men reported walking to social and healthcare activities, compared to 3.5% and 5% respectively for women.

By contrast, 3.5% and 4% of women reported walking to cultural and shopping activities, while 2.5% and 3.7% of men reported doing the same.

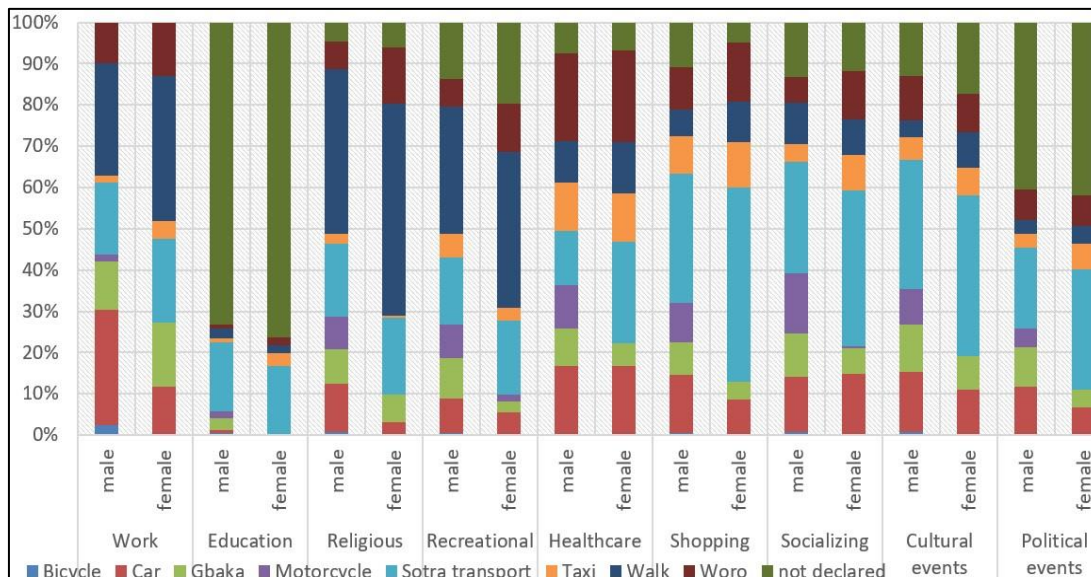


Figure 5.17. Choice of usual travel mode by activity

As a result, men are more likely to walk to religious and work activities, while women are more likely to walk to cultural and shopping activities. Therefore, there are differences between women and men in terms of the types of activities they engage in. Men tend to work in areas farther from their homes, which may explain this phenomenon. Women, on the other hand, are more likely to work closer to their homes. In addition, it appears that women are more likely than men to engage in leisure activities near their homes, such as shopping and cultural activities. This could explain why men tend to walk further than women, since they are more likely to walk to work, while women tend to walk for leisure purposes. Additionally, this suggests that women may benefit more from improved access to walking trails and other amenities near their homes (Bande and Kaplan, 2023).

After walking, men used public transport (both formal and informal) more frequently than women. Women were more likely to use private vehicles to travel. This difference in transportation mode use may be due to differences in access to resources and mobility restrictions. Men reported using public transportation modes (Gbaka, SOTRA, Taxi, and Woro-woro) for work at a rate of 24.4%, while women reported using them at a rate of 21.3%. The proportion of men who use public transport for educational purposes was 12.7%, while the proportion of women was only 8.6%. Also, 33.2% and 21.2% of men reported using public transport for healthcare and recreational activities, respectively, compared to 25.9% and 14.1% of women. Men reported using public transport for religious activities at a rate of 20.9% compared to women at 15.9%. The difference between the two genders is

statistically significant, as evidenced by the p-value of 0.03. These results suggest that men are more likely to access transportation for religious activities than women. Additionally, this indicates that cultural factors may influence the gender gap in transportation access for religious activities.

Overall, walking is the primary mode of transportation for all OOH activities for both genders. However, men walk for the majority of activities, while women walk more often for cultural and shopping activities. In addition, men are more likely to use public transportation while women are more likely to use private vehicles. According to the World Bank (2008), due to limited private car ownership, much of the population in developing countries relies on public transportation due to the lack of basic land uses within walking distance. In terms of daily trips, men reported participating in OOH activities more frequently than women. Men are more likely to travel daily to/from work and education activities than women. Shopping and healthcare activities are the only exception trips, where women reported a higher frequency of participation than men on alternate days.

In conclusion, these results indicate that men are more likely to use all modes of transport for a variety of activities than women. These numbers show that there is a gender gap in transport access, with men traveling more frequently than women. This gap is particularly relevant for educational and recreational purposes (Bande and Kaplan, 2023).

In summary, these results provide evidence to support the hypothesis that women have a lower frequency of OOH activity participation than men. The results are consistent with previous studies that show women often face gender-based transport inequality. Additionally, women are more likely to use public transport, and are more likely to face safety issues, particularly in urban areas. As such, it is important to identify and address these issues to ensure women have safe and reliable access to public transport. This highlights the need for increased safety measures and better transport access for women.

5.6.2. H2 - Individuals with lower incomes engage less frequently in OOH activities

There is a direct relationship between an increase in monthly income and the frequency of participation in such activities. This pattern suggests a link between lower economic status and diminished engagement in OOH activities.

Gender influences transport accessibility and the frequency of activity participation. In this hypothesis, the aim is to see if gender has any impact on the frequency of OOH activities. By testing this hypothesis, the aim is to assess whether women have a lower frequency of OOH activity participation than men.

Differences in frequency of OOH activity participation according to income

The results indicate a statistically significant relationship of monthly income with work-related activity participation ($p=0.000<0.01$), education ($0.000<0.01$), religious ($0.000<0.01$), recreational ($0.000<0.01$), healthcare ($0.000<0.01$), shopping ($0.000<0.01$), socializing ($0.000<0.01$), cultural events ($0.000<0.01$) and political events ($0.000<0.01$).

Table 5.9. Frequency of OOH activities based on monthly income

Variables	Monthly Income					p-value
	Less than 200 USD n	200-400 USD n	400-800 USD n	800-1600 USD	1600 USD and above n	
Work						
Daily	65	73	35	30	30	
Alternate day	15	7	3	5	1	
Twice weekly	12	6	9	8	0	0.000
Weekly	7	3	9	0	3	
Twice a month	3	3	1	0	0	
Monthly	3	4	0	1	0	
Occasionally	7	3	2	0	0	
Education						
Daily	0	5	39	16	2	
Alternate day	0	1	6	5	0	
Twice weekly	0	1	3	6	0	
Weekly	0	0	0	0	1	
Twice a month	0	0	2	0	0	0.000
Monthly	0	0	0	1	1	
Occasionally	6	0	4	1	0	
Religious						
Daily	25	42	18	13	3	
Alternate day	11	5	8	6	3	
Twice weekly	16	34	21	12	3	0.000
Weekly	24	3	16	16	21	
Twice a month	2	3	4	2	2	
Monthly	9	1	8	3	1	
Occasionally	22	11	11	4	0	
Recreational						
Daily	0	5	7	3	1	
Alternate day	4	2	3	6	3	
Twice weekly	12	9	19	8	6	0.000
Weekly	14	42	20	20	5	
Twice a month	8	5	5	4	7	
Monthly	6	3	6	3	5	
Occasionally	41	28	24	9	2	

Table 5.9. (continued) Frequency of OOH activities based on monthly income

Variables	Monthly Income					p-value
	Less than 200 USD n	200-400 USD n	400-800 USD n	800-1600 USD	1600 USD and above n	
Healthcare						
Daily	0	1	0	0	0	
Alternate day	0	0	2	7	3	
Twice weekly	0	1	4	10	6	
Weekly	0	2	7	4	7	0.000
Twice a month	20	13	13	4	3	
Monthly	26	54	28	16	7	
Occasionally	56	22	34	15	6	
Shopping						
Daily	0	1	0	2	0	
Alternate day	3	0	3	4	3	
Twice weekly	2	4	4	7	5	0.000
Weekly	8	6	3	9	5	
Twice a month	5	8	8	8	4	
Monthly	17	34	23	14	5	
Occasionally	6	42	46	11	6	
Socializing						
Daily	0	0	3	2	0	
Alternate day	2	1	1	6	4	
Twice weekly	5	1	4	5	2	
Weekly	7	3	7	2	3	0.000
Twice a month	11	23	14	14	11	
Monthly	24	18	13	13	8	
Occasionally	48	37	38	11	4	
Cultural events						
Daily	0	1	0	0	0	
Alternate day	0	0	4	3	4	
Twice weekly	0	0	2	7	2	
Weekly	3	3	2	4	5	0.000
Twice a month	14	7	13	18	6	
Monthly	11	19	14	12	4	
Occasionally	64	56	46	11	5	
Political events						
Daily	0	1	1	0	1	
Alternate day	0	0	0	2	4	
Twice weekly	0	0	1	9	3	
Weekly	0	3	0	4	4	0.000
Twice a month	0	6	9	9	5	
Monthly	5	9	7	9	3	
Occasionally	64	40	44	14	7	

Based on their monthly income levels (Less than 200 USD, 200-400, 400-800, 800-1600, 1600, and above), the results examine the frequency of various activities (Work, Education, Religious, Recreational, Healthcare, Shopping, Socializing, Cultural events, and Political events). As a result, the following interpretation was reached:

- Work: Low-income participants (less than 200 USD and 200-400 USD) were more likely to work daily (65 and 73, respectively), while high-income participants (above 1600

USD) were more likely to work daily (30) or weekly (3) and very rarely every month. The p-value (<0.05) indicates a significant relationship between income level and work. Work frequency and income level are significantly related (p-value 0.05).

- Education: Daily educational activities were most prevalent among participants with incomes of 400-800 USD (39). Income groups between 800-1600 USD attended education more often on alternate days or twice a week. The p-value indicates whether there is a significant association.
- Religious: Religious activities daily were most common in lower income groups (less than 200 USD and 200-400 USD) (respectively 25 and 42), while religious activities every week were most prevalent in the highest income group (above 1600 USD) (21). A significant difference exists in the frequency of religious activities across income levels.
- Recreational: For lower income groups (less than 200 USD and 200-400 USD), recreational activities were more occasional (41 and 28 respectively), while higher income groups (800-1600 USD and 1600 USD and above) showed a more varied pattern. P-values indicate significant differences among income groups.

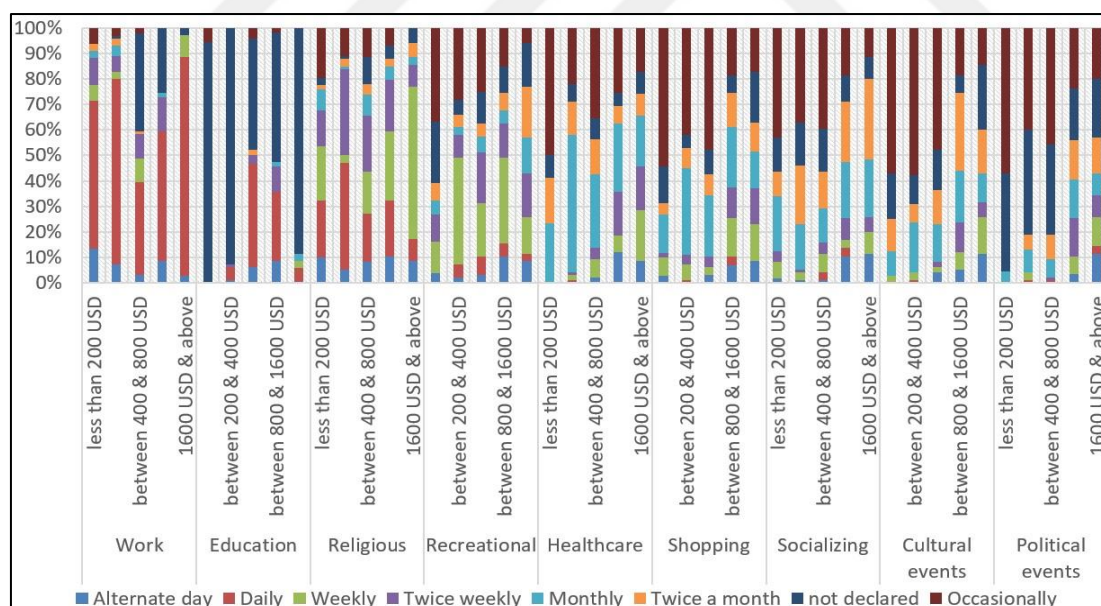


Figure 5.18. Frequency of OOH activities based on monthly income

- Healthcare: Low-income groups (less than 200 USD and 200-400 USD) were more likely to seek healthcare services monthly or occasionally (26-56 and 54-22, respectively). Conversely, higher income groups (above 1600 USD) engaged in fewer healthcare

activities. P-values show a statistically significant relationship between these two variables.

- Shopping: In terms of shopping behavior, there were insignificant differences between income groups. A majority of participants, regardless of income level, shopped occasionally, weekly, or monthly.
- Socializing: Low-income groups (less than 200 USD and 200-400 USD) socialized mostly monthly or occasionally (24-48 and 18-37), while those with higher income showed more varied socialization patterns, from alternate days to monthly. The variance is statistically significant.
- Cultural events: All income groups were more likely to attend cultural events occasionally, with the highest frequency among those earning less than 200 USD (64), followed by those earning 200-400 USD (56) and 400-800 USD (46). P-values indicate statistical significance.
- Political events: Across all income levels, participation in political events was generally occasional or monthly, with significant differences in the P-value.

From the crosstabs, there are more people from low-income groups who participate in work-related activities and education-related activities more frequently. Contrary to this, very few people from the low-income groups participate in recreational, healthcare, shopping, social, cultural, and political events as attending these activities need money and they may not be able to afford it.

Frequency of activity cancellation based on income

Further, it was tested how monthly income affects the cancellation of OOH activities due to non-access to transportation. One-way ANOVA has been applied to rate the cancellation of OOH activities participation based on their monthly income. The respondents were asked to rate the cancellation scale from 1-very often to 5= never. ANOVA indicates that significant differences exist in different income groups regarding the cancellation of OOH events because of travel-related issues.

There is a significant impact of poverty resulting in transport unavailability on canceling education-related activities ($p=0.000<0.01$), religious ($0.001<0.050$), healthcare ($0.023<0.05$), shopping ($0.000<0.01$), socializing ($0.006<0.01$), cultural activities ($0.000<0.01$) and political activities ($0.002<0.01$). However, work-related activities

($p=0.135>0.05$) and recreational activities ($0.056>0.05$) are not impacted by poverty and are rarely canceled due to transport unavailability.

Table 5.10. Cancellation rate of OOH activities

Cancellation		N	Mean	Std. Deviation	P-values
Work	less than 200 USD	90	1.5000	.62261	0.135
	between 200 and 400 USD	86	1.5698	.60470	
	between 400 and 800 USD	56	1.7321	.84188	
	between 800 and 1600 USD	37	1.7027	.70178	
	1600 USD and above	30	1.8000	.84690	
Education	less than 200 USD	11	4.0909	1.30035	0.000
	between 200 and 400 USD	9	1.7778	.44096	
	between 400 and 800 USD	51	1.9804	1.02937	
	between 800 and 1600 USD	29	2.0690	1.03272	
	1600 USD and above	4	2.5000	1.91485	
Religious	less than 200 USD	102	1.3529	.55664	0.001
	between 200 and 400 USD	95	1.3263	.53479	
	between 400 and 800 USD	90	1.5444	.78126	
	between 800 and 1600 USD	58	1.7414	.88971	
	1600 USD and above	30	1.5000	.50855	
Recreational	less than 200 USD	84	2.0595	1.19589	0.056
	between 200 and 400 USD	92	1.8370	.89292	
	between 400 and 800 USD	87	2.3333	1.33527	
	between 800 and 1600 USD	55	2.2000	1.20800	
	1600 USD and above	29	2.0345	.68048	
Healthcare	less than 200 USD	103	2.2524	1.16078	0.023
	between 200 and 400 USD	95	2.1158	.76996	
	between 400 and 800 USD	88	2.1591	1.12328	
	between 800 and 1600 USD	57	2.1754	1.01985	
	1600 USD and above	33	1.5758	.86712	
Shopping	less than 200 USD	100	2.8500	1.00880	0.000
	between 200 and 400 USD	94	2.2128	.76020	
	between 400 and 800 USD	86	2.7209	1.11304	
	between 800 and 1600 USD	57	2.8246	1.03721	
	1600 USD and above	29	3.1724	1.13606	
Socializing	less than 200 USD	102	2.7255	1.05452	0.006
	between 200 and 400 USD	88	2.2841	.89634	
	between 400 and 800 USD	80	2.5750	1.04063	
	between 800 and 1600 USD	56	2.7500	1.09959	
	1600 USD and above	33	2.9394	1.14399	
Cultural	less than 200 USD	93	3.3011	1.18675	0.000
	between 200 and 400 USD	89	2.3820	.80489	
	between 400 and 800 USD	78	2.8333	1.10978	
	between 800 and 1600 USD	52	2.7885	1.03538	
	1600 USD and above	31	2.8387	1.26746	
Political	less than 200 USD	73	3.2055	1.11752	0.002
	between 200 and 400 USD	56	2.5179	.95329	
	between 400 and 800 USD	60	2.9667	1.20685	
	between 800 and 1600 USD	44	3.2500	1.22237	
	1600 USD and above	32	2.5625	1.36636	

The table depicts the mean scores and standard deviations of various forms of activity cancellations (like work, education, religious, recreational, healthcare, shopping, socializing, cultural, and political) across the different income groups (less than 200 USD, between 200 and 400 USD, between 400 and 800 USD, between 800 and 1600 USD, and 1600 USD and above).

- **Work Cancellations:** As income increases, the mean cancellation score gradually increases, but not significantly ($p\text{-value} = 0.136$). Statistically, higher-income groups have a slightly higher rate of work cancellation, but the difference is not statistically significant.
- **Education Cancellations:** The highest cancellation rate was found among people earning less than 200 USD. The lowest score was for people earning between 200 and 400 USD. The $p\text{-value}$ indicates a statistically significant difference (0.000).
- **Religious Cancellations:** The mean score increased for income between 800-1600 USD, but then slightly dropped for the highest income group (1600 USD and above). $P\text{-value}=0.001$, the difference is statistically significant.
- **Recreational Cancellations:** Although the $p\text{-value}$ of 0.056 is not statistically significant, the mean cancellation score seemed to be highest for the 400-800 USD income group.
- **Healthcare Cancellations:** High-income groups (1600 USD and above) had the lowest cancellation rate. $P\text{-value}=0.023$ indicated a statistically significant difference.
- **Shopping Cancellations:** The highest income group (1600 USD and above) had the highest mean cancellation score, indicating they canceled shopping the most. $P\text{-value} = 0.000$, there was a statistically significant difference.
- **Socializing Cancellations:** Higher-income groups (1600 USD and above) had the highest mean score, indicating more cancellations. The difference ($p\text{-value} = 0.006$) was statistically significant.
- **Cultural Cancellations:** The lowest income group (less than 200 USD) had the highest mean score, suggesting they canceled cultural events most frequently. The difference was statistically significant ($p\text{-value}=0.000$).
- **Political Cancellations:** For the 1600 USD and above income group, the mean score was lowest (i.e., least cancellations), while the highest score was achieved by the 800-1600 USD income group. Differences (0.002 $p\text{-values}$) were statistically significant.

The standard deviation indicates the degree of variability within each income group. Increasing values indicate less consistency in cancellation behavior within that income group.

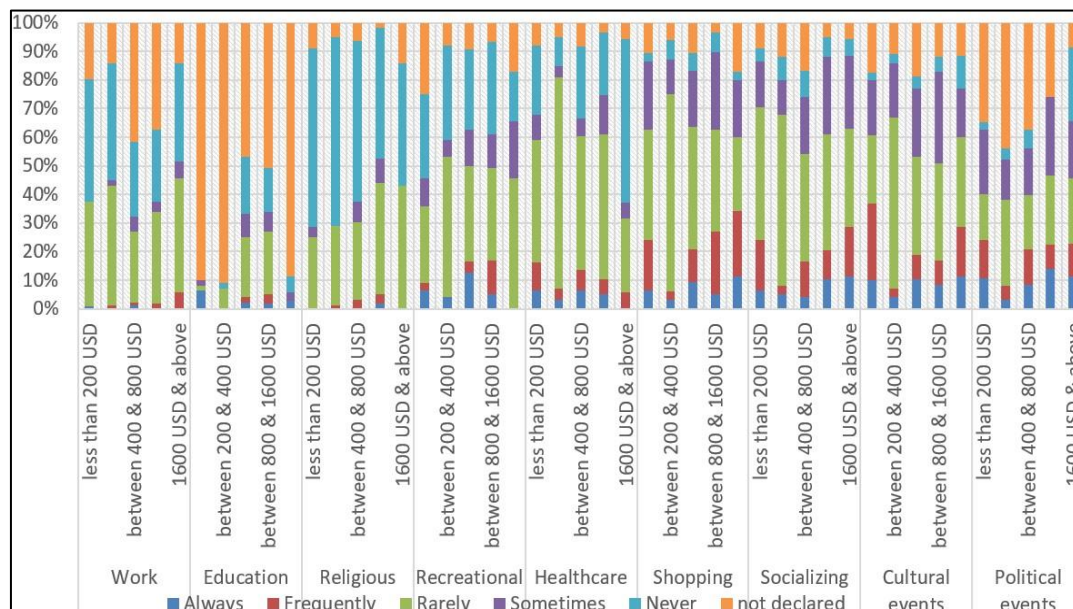


Figure 5.19. Cancellation rate of OOH activities based on monthly income

Choice of usual travel mode according to income

The figure represents the transportation mode choices of individuals across different income levels and for various activities or purposes. The mode choices include Bicycle, Car, Gbaka, Motorcycle, Public transport, Taxi, Walking, and Woro-Woro. There are five income groups, starting from 'less than 200 USD' up to '1600 USD and above'. This stratification provides insights into how economic capacities impact transport choices.

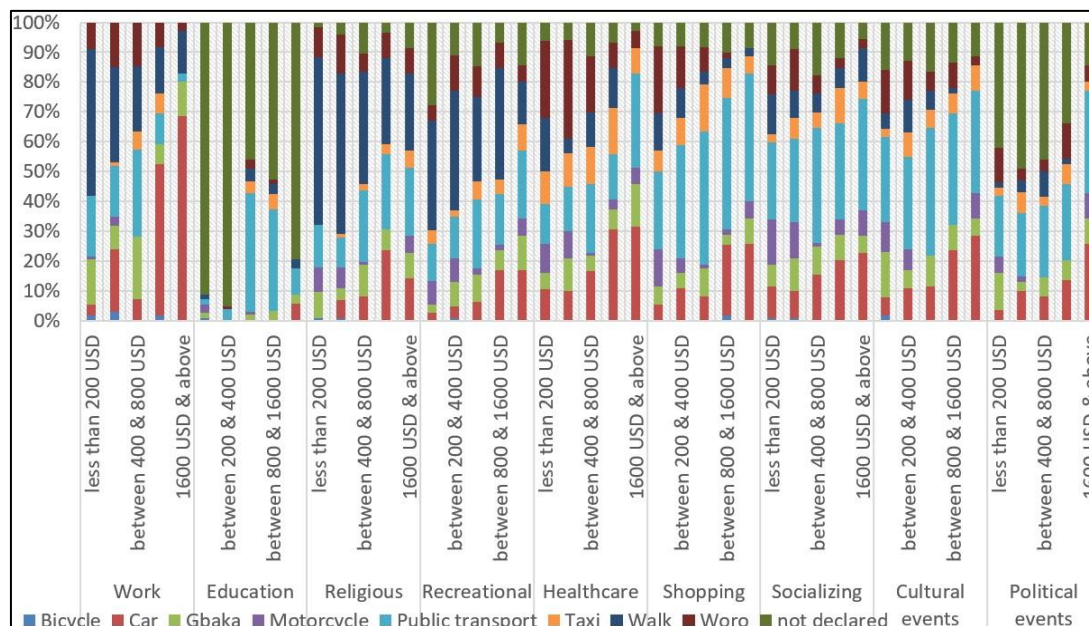


Figure 5.20. Choice of transportation mode for different activities across income levels

The graph reveals that the majority of lower-income persons (those earning less than USD 200) prefer walking, particularly for work-related activities (55). Walking is also the preferred mode of transportation for persons with a middle income (between \$200 and 800 USD). There is a noticeable increase in the number of automobile users among higher-income residents (between 800 and 1600 USD and above), particularly for work-related activities. Car use dominates most activity categories for the highest income group. Car usage rises as income levels grow.

- Work: Walking is the most common transport mode for lower-income groups, while car usage significantly increases for higher-income groups.
- Education: Many individuals in the lower and middle-income categories did not declare their mode of transportation.
- Religious: Walking dominates also the transportation mode for the lower income group.
- Recreational: Walking and public transport are common modes across all income levels.
- Healthcare: For lower-income groups, walking and public transport are common modes.
- Shopping: Walking, public transport, and car usage are the predominant modes. These modes spread almost evenly across all income groups.
- Socializing: The usage of public transport, especially in the middle-income group is noticeable.

- Cultural Events: Public transport and walking seem to be the preferred mode choices across all income levels.
- Political Events: A significant number of individuals in the lower and middle-income categories did not declare their mode of transport.

Clear patterns appear when a full picture of mode choices across activities and income levels is painted, demonstrating how financial capability (income) impacts the mode of transportation choice. Furthermore, the mode of transportation varies not just with income but also with the nature of the activity. Given the disparities in emissions from modes such as walking, cycling, private cars, and public transportation, future studies may explore deeper into the underlying reasons, socioeconomic consequences, and environmental repercussions of these different transportation mode choices.

There is a statistically significant association between frequency and income level for all of these activities, showing how income influences one's lifestyle and engagement in social, educational, and religious activities. The lower the income, the more occasional the participation in most activities. Low incomes lead to lower participation rates in most activities. It may be a result of financial constraints. Conversely, individuals with higher incomes participate in most activities more frequently, possibly due to their better financial situation.

5.6.3. H3-Individuals from households with personal vehicles participate in activities at a higher frequency compared to those without private transportation.

This indicates that vehicle ownership is a significant determinant of mobility and engagement in activities, highlighting disparities in access to transportation.

To test this hypothesis, a new variable was computed by keeping MV and 1V (Owned vehicle) in one category and 0VO and 0VR (No vehicle) in the other category.

Frequency of OOH activity participation according to vehicle ownership

According to the cross-tabulation, owning a vehicle has no correlation with attendance at work ($p=0.104>0.050$) or education-related events ($0.140>0.05$). Even if people do not own

a vehicle, they have to go to work and educational activities, while they can miss other activities if they do not own a vehicle.

Table 5.11. Activity participation according to vehicle ownership

Activities	Owned Vehicle	No Vehicle	p-value
Work			
Daily	66	167	
Alternate day	6	25	
Twice weekly	9	26	0.104
Weekly	3	19	
Twice a month	0	7	
Monthly	1	7	
Occasionally	0	12	
Education			
Daily	20	42	
Alternate day	5	7	
Twice weekly	6	4	
Weekly	1	0	
Twice a month	0	2	0.140
Monthly	1	1	
Occasionally	1	10	
Religious			
Daily	17	84	
Alternate day	10	23	
Twice weekly	19	67	0.000
Weekly	36	44	
Twice a month	4	9	
Monthly	7	15	
Occasionally	4	44	
Recreational			
Daily	5	11	
Alternate day	10	8	.000
Twice weekly	15	39	
Weekly	28	73	
Twice a month	11	18	
Monthly	8	15	
Occasionally	11	93	
Healthcare			
Daily	0	1	
Alternate day	12	0	
Twice weekly	18	3	
Weekly	13	7	0.000
Twice a month	9	44	
Monthly	24	107	
Occasionally	20	113	
Shopping			
Daily	2	1	
Alternate day	10	3	
Twice weekly	14	8	0.000
Weekly	14	17	
Twice a month	14	19	
Monthly	20	73	
Occasionally	17	149	
Socializing			
Daily	2	3	
Alternate day	10	4	
Twice weekly	8	9	
Weekly	8	14	0.000
Twice a month	25	48	
Monthly	24	52	

Table 5.11. (continued) Activity participation according to vehicle ownership

Activities	Owned Vehicle	No Vehicle	p-value
Occasionally	15	123	
Cultural events			
Daily	0	1	
Alternate day	9	2	
Twice weekly	9	2	
Weekly	9	8	0.000
Twice a month	27	31	
Monthly	16	44	
Occasionally	19	163	
Political events			
Daily	1	2	
Alternate day	6	0	
Twice weekly	13	0	
Weekly	8	3	0.000
Twice a month	16	13	
Monthly	14	19	
Occasionally	21	148	

There is a significant relationship between owning a vehicle and attending religious activities ($p=0.000<0.01$), recreational ($p=0.000<0.01$), healthcare ($p=0.000<0.01$), shopping ($p=0.000<0.01$), socializing ($p=0.000<0.01$), cultural events ($p=0.000<0.01$) and political events ($p=0.000<0.01$). Therefore, owning a vehicle can be a determining factor for individuals' quality of life, as it provides access to a variety of activities.

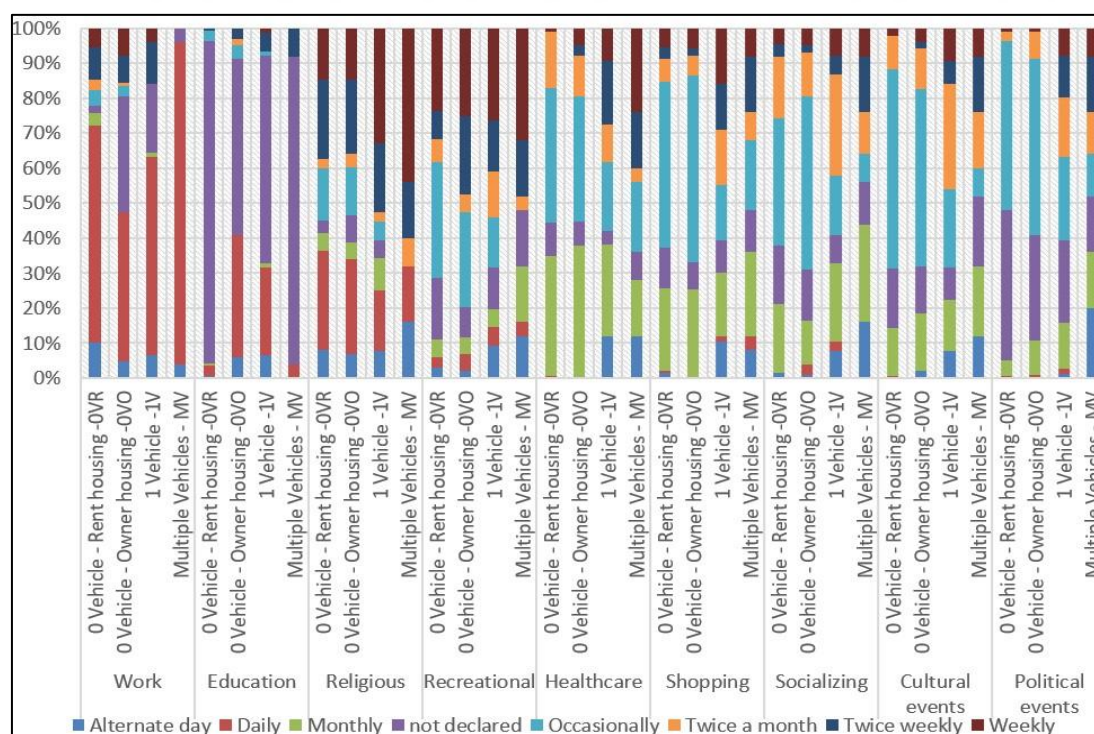


Figure 5.21. Frequency of activity participation according to vehicle ownership

Issues to access public transport based on vehicle ownership

Further, an independent sample t-test has been applied to check if access to OOH activities is an issue based on having a vehicle or not.

Table 5.12. Access to OOH activities based on vehicle ownership

Issues	Vehicle ownership	N	Mean	Std. Deviation	P values
Job/Income	Vehicle	71	2.2958	1.10058	0.962
	No Vehicle	234	2.3034	1.22467	
Education	Vehicle	36	2.5556	1.20581	0.903
	No Vehicle	80	2.5250	1.26266	
Religious	Vehicle	92	2.2174	1.38140	0.449
	No Vehicle	273	2.0952	1.32221	
Recreational/sport	Vehicle	87	2.2759	1.11741	0.070
	No Vehicle	252	2.5437	1.20510	
Healthcare	Vehicle	93	2.5054	1.31566	0.570
	No Vehicle	278	2.4209	1.21328	
Shopping	Vehicle	93	2.9892	1.21131	0.029
	No Vehicle	273	2.6923	1.09503	
Socializing	Vehicle	91	2.8022	1.32682	0.837
	No Vehicle	247	2.8340	1.23663	

From the results, there is no significant difference between the respondents having a vehicle or not regarding access to events including work ($p=0.962>0.050$), education ($0.903>0.050$), religious ($0.449>0.050$), recreational ($0.070>0.050$), healthcare ($0.570>0.050$) and socializing ($0.837>0.050$).

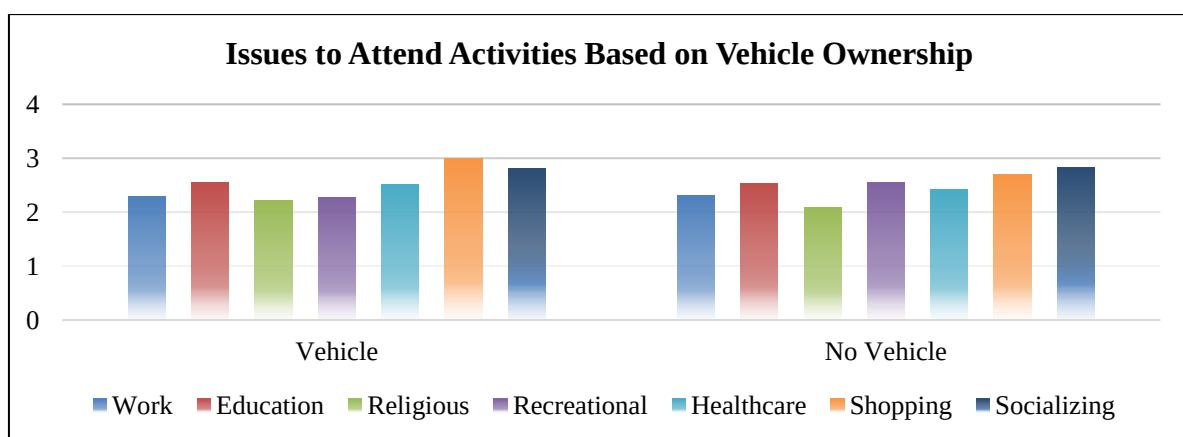


Figure 5.22. Issues attending OOH activities based on vehicle ownership

In contrast, there is a difference between the groups for shopping ($p=0.029>0.05$), in which people with vehicles think shopping would be a major challenge if they do not have one.

Frequency of activity cancellation based on vehicle ownership

Additionally, an independent sample t-test has been applied to test if there is any difference in the cancellation of any events based on owning a vehicle or not. The results provide comparisons between vehicle owners and non-vehicle owners in terms of their participation frequency in different activities, and whether owning a vehicle influences the cancellation of these activities. To test if there is any difference in event cancellation based on owning a vehicle or not, an independent sample t-test has been applied:

- Work: The mean for vehicle owners is 1.7467 (SD=0.79003) and for non-vehicle owners is 1.5759 (SD=0.66532). The p-value is 0.068 which is just above the conventional cut-off for statistical significance of 0.05. Therefore, there is a trend suggesting that vehicle owners might cancel work activities less frequently than those who do not own a vehicle, although this did not reach statistical significance.
- Education: The p-value (0.247) suggests no significant difference between vehicle owners and non-vehicle owners in terms of cancellation of education-related activities.
- Religious: The mean for vehicle owners is 1.6250 (SD=0.77119) and for non-vehicle owners is 1.4086 (SD=0.63874). The p-value is 0.007, indicating that vehicle owners significantly cancel religious activities less frequently than those who do not own a vehicle.
- Recreational: The p-value (0.825) indicates no significant difference between vehicle owners and non-vehicle owners in terms of cancellation of recreational activities.
- Healthcare: The mean for vehicle owners is 1.9381 (SD=0.97697) and for non-vehicle owners is 2.1900 (SD=1.04043). The p-value is 0.038, indicating that vehicle owners significantly cancel healthcare activities less frequently than those who do not own a vehicle.
- Shopping: The p-value (0.103) suggests no significant difference between vehicle owners and non-vehicle owners in terms of cancellation of shopping activities, although there is a trend suggesting that vehicle owners might cancel shopping activities less frequently.
- Socializing: The p-value (0.148) suggests no significant difference between vehicle owners and non-vehicle owners in terms of cancellation of socializing activities.
- Cultural: The p-value (0.256) suggests no significant difference between vehicle owners and non-vehicle owners in terms of cancellation of cultural activities.

- Political: The p-value (0.664) indicates no significant difference between vehicle owners and non-vehicle owners in terms of cancellation of political activities.

Table 5.13. Cancellation rate of activities based on vehicle owning

Cancellation of event	Vehicle ownership	N	Mean	Std. Deviation	p-value
Work	Vehicle	75	1.7467	.79003	0.068
	No Vehicle	224	1.5759	.66532	
Education	Vehicle	34	2.0294	1.14111	0.247
	No Vehicle	70	2.3286	1.27087	
Religious	Vehicle	96	1.6250	.77119	0.007
	No Vehicle	279	1.4086	.63874	
Recreational	Vehicle	89	2.1124	1.03834	0.825
	No Vehicle	258	2.0814	1.17246	
Healthcare	Vehicle	97	1.9381	.97697	0.038
	No Vehicle	279	2.1900	1.04043	
Shopping	Vehicle	93	2.8280	1.06958	0.103
	No Vehicle	273	2.6264	1.01440	
Socializing	Vehicle	96	2.7396	1.11681	0.148
	No Vehicle	263	2.5589	1.01672	
Cultural	Vehicle	90	2.7222	1.10187	0.256
	No Vehicle	253	2.8775	1.11484	
Political	Vehicle	80	2.8875	1.34064	0.664
	No Vehicle	185	2.9568	1.11719	

The results show that there is a significant impact of owning a vehicle on canceling religious events ($p=0.007<0.01$) and healthcare activities ($p=0.038<0.05$). Other activities i.e., work ($p=0.068>0.050$), education ($0.247>0.050$), recreational ($0.825>0.050$), shopping ($0.103>0.050$), socializing ($0.148>0.050$), cultural ($0.256>0.050$) and political activities ($0.664>0.050$) are not affected by owning a vehicle.

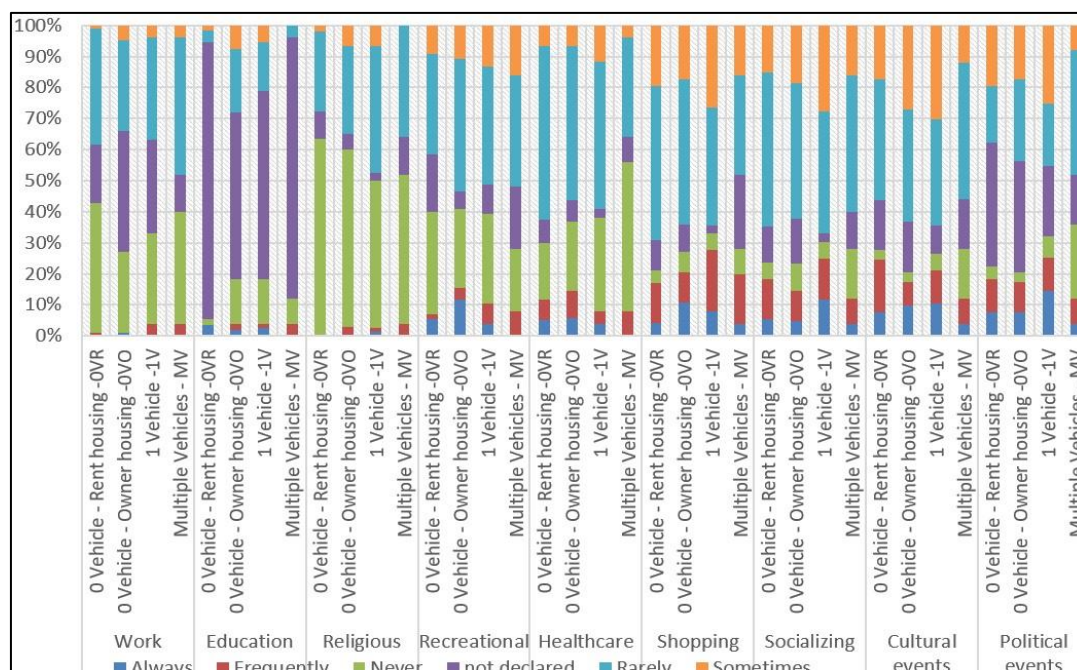


Figure 5.23. Activities cancellation rate based on vehicle ownership

In summary, vehicle owners cancel religious and healthcare activities less frequently than non-vehicle owners, which is statistically significant. There is also a trend for less frequent cancellation of work and shopping activities among vehicle owners, though these did not reach statistical significance. For other activities (education, recreational, socializing, cultural, political), no significant differences were found between vehicle owners and non-vehicle owners. Therefore, the hypothesis that vehicle owners have a higher frequency of activity participation compared to those who do not own a vehicle is only partially supported.

5.6.4. H4- Vulnerable populations (the elderly, women, disabled individuals, and children) utilize public transportation less frequently than other demographic groups.

This disparity in usage can be attributed to a range of factors, including physical challenges, cultural norms, and gender roles influence, all of which significantly influence the mobility patterns of these groups. Such dynamics underscore the critical need to examine mobility behaviors and the perceptions of TRSE within the intricate sociocultural fabric of Abidjan.

Here, a Chi-square test examines the relationship between different vulnerable groups (elderly, disabled, women, poor, children, and not declared) and their use of public transport for different daily activities (work, education, religion, recreational, healthcare, shopping,

socializing, cultural events, and political events). The p-value represents the probability that there is no difference in public transport use among these vulnerable groups. When p-values are less than 0.05, statistically they are considered significant, indicating that the observed results are not due to chance and that these groups use different forms of public transport.

- Work: P-value=0.268. It is not statistically significant, suggesting there is no difference in the use of public transport for education among these groups.
- Education: P-value=0.543 is not statistically significant, suggesting there is no difference in the use of public transport for education among these groups.
- Religious: P-value=0.319 is not statistically significant, suggesting there is no difference in the use of public transport for religious activities among these groups.
- Recreational: P-value=0.353 is not statistically significant, suggesting there is no difference in the use of public transport for recreational activities among these groups.
- Healthcare: The p-value is 0.050, which is just on the edge of statistical significance, suggesting there might be a slight difference in the use of public transport for healthcare among these groups. Specifically, it might imply that vulnerable groups might be less likely to use public transportation to access healthcare facilities.
- Shopping: P-value=0.000 is statistically significant, suggesting a difference in public transport use shopping among these groups. Notably, it appears that women are much more likely to use public transportation for shopping compared to other groups.
- Socializing: P-value=0.011 is statistically significant, suggesting a difference in public transport use for socializing among these groups.
- Cultural Events: P-value=0.014 is statistically significant, suggesting a difference in public transport use for attending cultural events among these groups.
- Political Events: P-value=0.023 is statistically significant, suggesting a difference in public transport use for attending political events among these groups.

Table 5.14. Vulnerable people's use of public transport for OOH activities

Activities	Other	Public transport	p-value
Work			
Elderly	44	6	
Disables	12	0	
Women	89	22	0.268
Poor	55	12	
Children	3	2	
not declared	124	33	
Total	327	75	
Education			
Elderly	5	6	
Women	8	20	
Poor	5	4	
Children	1	3	
not declared	16	34	0.543
Total	35	67	
Religious			
Elderly	40	5	
Disables	12	0	
Women	81	24	0.319
Poor	53	12	
Children	3	1	
not declared	120	30	
Total	309	72	
Recreational			
Elderly	36	6	
Disables	9	0	
Women	68	21	0.353
Poor	46	8	
Children	3	1	
not declared	107	32	
Total	269	68	
Healthcare			
Elderly	42	4	
Disables	9	3	
Women	74	28	
Poor	56	8	0.050
Children	5	0	
not declared	115	29	
Total	301	72	
Shopping			
Elderly	36	7	
Disables	9	3	
Women	49	58	0.000
Poor	45	17	
Children	2	3	
not declared	76	63	
Total	217	151	
Socializing			
Elderly	31	7	
Disables	8	3	
Women	56	39	
Poor	47	14	0.011
Children	2	3	
not declared	81	60	
Total	225	126	

Table 5.14. (continued) Vulnerable people's use of public transport for OOH activities

Activities	Other	Public transport	p-value
Cultural events			
Elderly	31	10	
Disables	8	4	
Women	49	37	
Poor	44	21	0.014
Children	0	4	
not declared	73	62	
Total	205	138	
Political events			
Elderly	24	5	
Disables	3	4	
Women	30	27	
Poor	30	14	0.023
Children	0	2	
not declared	56	42	
Total	143	94	

It was hypothesized that vulnerable people used less public transport than others. The results of crosstabs show that there is no relationship between using public transport and vulnerable people for work ($p=0.268>0.050$), education ($0.543>0.050$), religious ($0.319>0.050$), recreational ($0.353>0.050$) and healthcare activities ($0.050=0.050$) while the relationship exists with shopping ($p=0.000<0.010$), socializing ($0.011<0.050$), political ($p=0.014<0.050$) and cultural activities ($0.023<0.050$).

These results indicate that vulnerable groups use public transportation differently for certain activities (Shopping, Socializing, Cultural, Political Events, and possibly Healthcare). Interestingly, these differences seem to be less pronounced in other activities (such as work, education, religion, and recreation). Overall, public transportation is an important service to those in vulnerable groups. It provides access to vital services and activities that are necessary for everyday life. It also allows them to engage in activities that are necessary for their health and well-being.

5.6.5. H5 - Less educated individuals are more likely to miss or cancel activities, while those with higher educational levels demonstrate a preference for private cars for daily commutes

This suggests an educational divide in transportation preferences and access. Educational attainment plays a pivotal role in activity engagement and transportation mode choice.

A chi-Square test was performed to examine the relationship between education level ("university", "high school", "primary", and "illiterate") and mode of access to work activities ("walk", "bicycle", "motorcycle", "car", "public transport", "Gbaka", "Woro Woro", and "taxi"). The results indicate that out of 86 respondents who use cars, 71 have completed university education and 13 have completed higher education. The value of significance for chi-square is $0.000 < 0.01$; the hypothesis is then accepted. There exists a significant difference between using cars and education level. This is well below the common alpha level of 0.05, suggesting that the null hypothesis of no association between level of education and mode of access to work activities can be rejected.

Here are some observations:

- For individuals who attended university, the most popular mode of access to work was by car (71 out of 192), followed by walking (40 out of 192) and public transport (35 out of 192).
- For high school graduates, the majority used public transport (21 out of 80), followed by "Woro Woro" and car (13 out of 80 each) and walking and "Gbaka" (12 out of 80 for both).
- Among individuals who only attended primary school, most walked to work (20 out of 43), followed by public transport (10 out of 43).
- For illiterate individuals, the majority walked to work (50 out of 87), followed by "Woro Woro" (15 out of 87).

Table 5.15. Mode of access to work activities according to education level

		Level of education				Total	P-value
		University	High school	Primary	Illiterate		
Mode of access to these activities (Work)	Walk	40	12	20	50	122	0.000
	Bicycle	2	1	0	3	6	
	Motorcycle	1	1	1	1	4	
	Car	71	13	1	1	86	
	Public transport	35	21	10	9	75	
	Gbaka	28	12	5	8	53	
	Woro Woro	12	13	5	15	45	
	Taxi	3	7	1	0	11	
Total		192	80	43	87	402	

There is a correlation between those who use cars and those who have higher levels of education, as the chi-square test shows that the hypothesis is accepted and the p-value is below 0.01. Consequently, there is a very strong correlation between a person's education level and their mode of transportation to access work activities. This suggests that those with higher education levels are more likely to use cars than those with lower education levels.

ANOVA results show that individuals with higher mean values of primary education are more likely to miss OOH events related to work ($p=0.040<0.05$), education ($0.036<0.05$), religion ($0.000<0.01$), and socializing ($0.006<0.01$). Contrary to this, those who have completed high school miss recreational ($p=0.357>0.05$), healthcare ($0.016<0.05$), and shopping activities ($0.008<0.05$).

Table 5.16. Missing OOH events according to education level

Miss Activities		N	Mean	Std. Deviation	p-values
Job/Income	University	176	2.2955	1.14801	0.040
	High school	24	2.5833	1.47196	
	Primary	36	2.6667	1.54919	
	Illiterate	69	2.0290	.92309	
	Total	305	2.3016	1.19518	
Education	University	21	2.5714	1.36277	0.036
	High school	72	2.5972	1.27445	
	Primary	13	2.9231	.75955	
	Illiterate	10	1.5000	.70711	
	Total	116	2.5345	1.24013	
Religious	University	171	2.0994	1.30904	0.000
	High school	73	2.4521	1.49109	
	Primary	39	2.6410	1.44162	
	Illiterate	82	1.6463	1.01071	
	Total	365	2.1260	1.33651	
Recreational/sport	University	161	2.3602	1.08716	0.357
	High school	73	2.6438	1.42760	
	Primary	29	2.5172	1.52645	
	Illiterate	76	2.5395	.97216	
	Total	339	2.4749	1.18738	
Healthcare	University	177	2.3164	1.16356	0.016
	High school	76	2.7632	1.41297	
	Primary	37	2.7297	1.57495	
	Illiterate	81	2.2840	.96481	
	Total	371	2.4420	1.23846	
Shopping	University	175	2.7771	1.11497	0.008
	High school	72	3.0833	1.18381	
	Primary	36	2.3333	1.17108	
	Illiterate	83	2.6627	1.03920	
	Total	366	2.7678	1.13144	
Socializing	University	163	2.6994	1.21785	0.006
	High school	66	3.0000	1.33589	
	Primary	32	3.4688	1.48072	
	Illiterate	77	2.6753	1.09354	
	Total	338	2.8254	1.25962	

Further, one-way ANOVA is used to see if the education level of the respondents affects missing or canceling activities. People are likely to miss work ($p=0.066>0.05$), education ($0.232>0.05$), religious ($0.044<0.05$), recreational ($0.001<0.05$), healthcare ($0.000<0.01$), and socializing ($0.001<0.05$), shopping ($0.416>0.05$), cultural ($0.298>0.05$) and political activities ($0.083>0.05$) more often based on their education level

Table 5.17. Activities cancelation rate based on education level

Activity cancellation		N	Mean	Std. Deviation	P-value
Work	University	173	1.5954	.67202	0.000
	High school	23	1.9130	.79275	
	Primary	36	1.0833	.28031	
	Illiterate	67	1.8657	.73640	
	Total	299	1.6187	.70123	
Education	University	16	2.2500	1.06458	0.000
	High school	74	1.9730	1.03332	
	Primary	8	4.6250	1.06066	
	Illiterate	6	2.1667	.75277	
	Total	104	2.2308	1.23250	
Religious	University	175	1.3143	.55561	0.000
	High school	76	1.8158	.87499	
	Primary	40	1.4000	.54538	
	Illiterate	84	1.4881	.66756	
	Total	375	1.4640	.68064	
Recreational	University	160	1.9125	.96079	0.001
	High school	75	2.4000	1.32543	
	Primary	35	2.5429	1.26823	
	Illiterate	77	1.9481	1.12269	
	Total	347	2.0893	1.13818	
Healthcare	University	182	1.9121	.82299	0.000
	High school	72	2.1806	1.22562	
	Primary	37	2.4865	1.19307	
	Illiterate	85	2.3765	1.07986	
	Total	376	2.1250	1.02908	
Shopping	University	172	2.5814	.97890	0.032
	High school	73	2.9726	1.16634	
	Primary	40	2.7750	1.16548	
	Illiterate	81	2.5679	.89356	
	Total	366	2.6776	1.03097	
Socializing	University	173	2.4624	.93076	0.009
	High school	67	2.9701	1.14111	
	Primary	35	2.6571	1.39205	
	Illiterate	84	2.5952	.97089	
	Total	359	2.6072	1.04590	
Cultural	University	166	2.6205	.93124	0.005
	High school	63	2.9841	1.23774	
	Primary	35	3.1714	1.44478	
	Illiterate	79	3.0253	1.12061	
	Total	343	2.8367	1.11195	
Political	University	123	2.5610	1.00935	0.005
	High school	52	3.4038	1.20879	
	Primary	21	3.4286	1.74847	
	Illiterate	69	3.1014	1.05920	
	Total	265	2.9358	1.18691	

The results of one-way ANOVA examined the impact of education level on cancellation of OOH activities. The education levels tested were University, High School, Primary, and Illiterate. OOH activities were Work, Education, Religious, Recreational, Healthcare, Shopping, Socializing, Cultural, and Political. The ANOVA was used to test the p-value for the F-test, the standard deviation, and the mean cancellation score for each activity. A p-value less than 0.05 is often used as an indicator of statistical significance, meaning more than 95% confidence. The interpretations for each activity are as follows:

- Work: There is a significant difference in cancellation rates across education levels (p-value = 0.000). University-educated individuals have the lowest mean cancellation (1.5954), whereas Illiterate have the highest (1.8657).
- Education: Similarly, cancellation rates significantly differ across education levels (p-value = 0.000). Those with primary education had the highest mean of cancellation (4.6250) and those with university education had a relatively lower mean (2.2500).
- Religious: Religion-related cancellation rates significantly differ across education levels (p-value = 0.000). Interestingly, the highest mean cancellation rate was seen in individuals with a high school education (1.8158).
- Recreational: There is a significant difference across education levels (p-value = 0.001). Individuals with primary education reported the highest mean cancellation rate (2.5429).
- Healthcare: There is a significant difference across education levels (p-value = 0.000). Individuals with primary education had the highest mean cancellation rate (2.4865).
- Shopping: The mean cancellation rates are significantly different across education levels (p-value = 0.032). High school-educated individuals had the highest mean cancellation rate (2.9726).
- Socializing: There is a significant difference across education levels (p-value = 0.009). The highest mean cancellation rate was reported by high school-educated individuals (2.9701).
- Cultural: The mean cancellation rates are significantly different across education levels (p-value = 0.005). Those with primary education had the highest mean cancellation rate (3.1714).
- Political: There is a significant difference in cancellation rates across education levels (p-value = 0.005). Those with primary education had the highest mean cancellation rate (3.4286).

In general, education level significantly affects the likelihood of activity cancellation. The pattern of these effects differs for different types of activity. Those who have completed high school are more likely to miss activities related to work, religion, socialization, and shopping. People with university education miss educational events more often. People who have completed primary education miss healthcare activities and political and cultural activities.

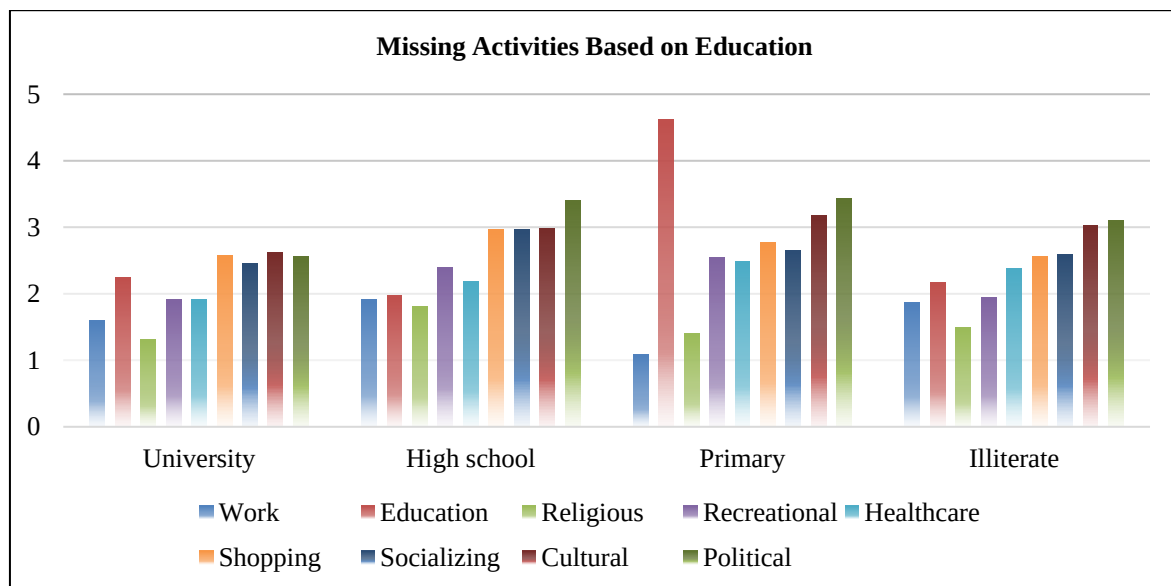


Figure 5.24. Activities cancelation rate based on education level

Generally, more educated individuals were less likely to cancel activities, while less educated individuals were more likely to cancel activities. These results suggest that education level is a significant factor to consider when predicting activity cancellation; this pattern is consistent across different types of activity.

Results support the hypothesis that "well-educated people use private cars more often than others for daily trips". The use of a car as a mode of access to work activities was noticeably more prevalent in the university-educated group (71 out of 192) than in the other groups. This suggests that higher education levels may be associated with higher income or status. This in turn may afford these individuals the ability to own or use a car for their work commute.

5.6.6. H6 - Residents of peripheral or informal settlements participate less in OOH activities compared to central/well-off neighborhoods.

This is evidenced by lower participation rates in social and recreational activities among residents of precarious neighborhoods, who also face higher instances of transport non-availability. Informal transportation systems emerge as critical in mitigating TRSE for these populations.

This one-way ANOVA examines the reasons for trip cancellation across different neighborhood types: slums, poor, mixed, residential, well-off, and not declared. The reasons tested include the quality of public transport, the cost of travel or fuel, non-availability of personal and public transport, fuel shortage, non-availability of escorts, political situations or strikes, and other issues.

- Cost of travel/fuel: P-value=0.001, there is a significant difference between neighbourhoods. Slum and mixed neighborhoods have higher means (2.36 and 2.56 respectively) than the other neighborhoods. This suggests that people living in these areas cancel trips more likely due to the cost of travel/fuel.
- Fuel shortage: With a p-value of 0.001, there is also a statistically significant difference between the neighborhoods regarding the issue of fuel shortage. The slums have the highest mean value (3.34), followed by mixed neighborhoods (2.70), well-off neighborhoods (2.40), residential neighborhoods (2.03), and poor neighborhoods (1.78). This suggests that fuel shortages are a more common reason for trip cancellation in the slums and mixed neighborhoods compared to the other types of neighborhoods. Notably, the well-off and residential neighborhoods, despite their affluence still show a somewhat high mean value. This indicates that fuel shortages are a widespread problem that affects all types of neighborhoods, but its impact is felt the most in slum and mixed neighborhoods.
- Non-availability of personal transport: P-value=0.137, there is an insignificant difference between the neighborhoods in terms of trip cancellation due to non-availability of personal transport. Although the means vary, the differences are not statistically significant.
- Non-availability of public transport: P-value=0.003, indicating a significant difference. Slums have the highest mean (2.84), followed by mixed (2.62) and poor (2.27)

neighborhoods; suggesting they face more non-availability of public transport compared to the other neighborhoods.

- Quality of public transport: The p-value of 0.288 suggests that the differences in the quality of public transport do not significantly impact trip cancellations across neighborhoods.
- Non-availability of escort: P-value=0.594, indicating insignificant difference across the neighborhoods.
- Political situation/strikes: P-value=0.338, there is insignificant difference between neighbourhoods. However, the means are somewhat high across all areas, suggesting that political situations or strikes may be a common issue leading to trip cancellations.
- Other issues: P-value=0.217 indicates insignificant difference among neighborhoods due to 'other issues'.

Table 5.18. Activity cancellation rate based on reason (issue)

Reason for trip cancellation		N	Mean	Std. Deviation	p-value
Cost of travel/fuel	Slums	38	2.3684	1.36404	0.032
	Poor	30	1.7667	1.07265	
	Mixed	75	2.5600	1.52670	
	Residential	36	2.1111	1.14087	
	well-off	5	1.2000	.44721	
	not declared	1	1.0000	.	
	Total	185	2.2595	1.36642	
Fuel shortage	Slums	29	3.3448	1.36998	0.001
	Poor	18	1.7778	1.00326	
	Mixed	65	2.7077	1.59808	
	Residential	30	2.0333	1.06620	
	well-off	5	2.4000	1.51658	
	not declared	1	1.0000	.	
	Total	148	2.5608	1.46722	
Nonavailability of personal transport	Slums	55	2.4182	1.19708	0.137
	Poor	50	2.3000	1.14731	
	Mixed	93	2.0645	.85728	
	Residential	36	2.0556	.71492	
	well-off	5	1.6000	.54772	
	not declared	2	1.5000	.70711	
	Total	241	2.1784	.99442	
Nonavailability of public transport	Slums	70	2.8429	1.50010	0.003
	Poor	65	2.2769	.92715	
	Mixed	148	2.6284	1.15045	
	Residential	59	2.1017	1.14010	
	well-off	5	1.8000	.83666	
	not declared	2	2.5000	.70711	
	Total	349	2.5043	1.20969	

Table 5.18. (continued) Activity cancellation rate based on reason (issue)

Reason for trip cancellation		N	Mean	Std. Deviation	p-value
Quality of transport public	Slums	82	2.2561	1.27474	0.288
	Poor	65	2.4923	1.17424	
	Mixed	150	2.4333	1.228390	
	Residential	57	2.1930	1.125020	
	well-off	6	1.5000	.83666	
	not declared	2	2.0000	.00000	
	Total	362	2.3481	1.20955	
Nonavailability of escort	Slums	70	2.0714	1.43781	0.594
	Poor	66	2.1667	1.22265	
	Mixed	143	2.3636	1.38170	
	Residential	49	2.0816	1.25560	
	well-off	6	1.8333	1.16905	
	not declared	2	2.5000	.70711	
	Total	336	2.2143	1.33894	
Political situation/strikes	Slums	85	2.5529	1.49209	0.338
	Poor	68	2.4559	1.51050	
	Mixed	153	2.7059	1.68149	
	Residential	59	2.2373	1.17941	
	well-off	6	3.0000	1.89737	
	not declared	2	1.5000	.70711	
	Total	373	2.5496	1.54008	
Other issues	Slums	35	3.6857	.99325	0.217
	Poor	47	3.6596	1.18462	
	Mixed	85	3.3882	1.03618	
	Residential	26	3.5000	1.06771	
	well-off	2	2.0000	1.41421	
	not declared	1	3.0000	.	
	Total	196	3.5051	1.07892	

The result of one-way ANOVA shows that slums and poor neighborhoods have higher mean values for missing or canceling activities due to cost of travel ($p=0.032<0.05$), fuel shortage ($p=0.001<0.01$), non-availability of public transport ($p=0.003<0.01$) due to which they are unable to attend OOH events. While no difference exists from other neighborhoods for missing events due to non-availability of personal transport ($p=0.137$), quality of public transport ($p=0.288$), non-availability of escort ($p=0.594$), political situations ($p=0.338$), and other issues ($p=0.217$); all those p-values being >0.05 .

Based on these results, it can be concluded that slums (with a p-value less than 0.05) had the highest mean for the two variables - fuel costs/cost of travel and lack of public transportation. Therefore, people living in slums are more likely to face these challenges than people in wealthier neighborhoods, which is consistent with the hypothesis. Public transport availability and travel costs have a significant impact on trip cancellations. Overall, this analysis supports the hypothesis that people living in precarious neighborhoods (like slums)

are facing more transport-related challenges, such as costs, lack of public transportation, and fuel shortages.

Frequency of OOH activity participation according to neighborhood

Cross-tabulation results show that there is a significant correlation between neighborhood type and recreational ($p=0.000<0.05$) and socializing activities participation ($p=0.000<0.05$). The frequency shows that poor and slum neighborhoods occasionally attend recreational and socializing activities.

Table 5.19. Correlation between neighborhood type and recreational and socializing activities participation

Variables	Type of inhabited neighborhood					p-value
	Slums	Poor	Mixed	Residential	well-off	
Recreational						
Daily	0	3	9	4	0	0.000
Alternate day	1	5	9	2	1	
Twice weekly	4	12	28	9	0	
Weekly	17	16	42	23	2	
Twice a month	10	5	8	6	0	
Monthly	7	3	10	3	0	
Occasionally	40	14	48	0	2	
Socializing						
Daily	1	0	2	2	0	0.000
Alternate day	2	3	5	4	0	
Twice weekly	2	2	9	3	1	
Weekly	2	5	9	6	0	
Twice a month	5	14	41	12	1	
Monthly	12	13	25	24	2	
Occasionally	41	25	64	6	1	
Occasionally	40	29	83	17	0	

Issues to access public transport according to neighborhood

Moreover, one-way ANOVA results indicate that participating in socializing activities is not related to residence in a slum or poor neighborhood ($p=0.152>0.05$) while attending sports or recreational activities is related to the type of neighborhood residing in ($p=0.006<0.05$). People agree that having slums or poor neighbors is a reason for not attending recreational activities.

Table 5.20. Issues with attending recreational and socializing activities according to neighborhood

Issues		N	Mean	Std. Deviation	p-value
Recreational/sport	Slums	79	2.8987	1.24648	
	Poor	58	2.3621	1.07112	
	Mixed	148	2.3716	1.15045	.006
	Residential	46	2.2174	1.17214	
	well-off	6	2.1667	1.16905	
Socializing	Slums	67	3.0746	1.29467	
	Poor	58	2.5000	1.08012	
	Mixed	151	2.8477	1.31529	.152
	Residential	54	2.8704	1.16629	
	well-off	6	2.6667	1.50555	

Frequency of activity cancellation based on type of neighborhood

Additionally, one-way ANOVA also depicts that the kind of neighborhood does not impact the kind of socializing activities ($p=0.331>0.05$) while the higher mean value for slum and poor indicates that having them as neighbors is an important reason for canceling the participation in recreational activities.

Table 5.21. Frequency of cancellation of events

Cancellation of event		N	Mean	Std. Deviation	p-value
Recreational	Slums	85	2.4118	1.46624	
	Poor	58	2.1207	1.15588	
	Mixed	149	1.9799	.93339	.041
	Residential	47	1.8936	.98321	
	well-off	6	1.8333	.75277	
Socializing	Slums	76	2.7763	1.27121	
	Poor	58	2.5517	.97643	
	Mixed	157	2.6115	.97171	.331
	Residential	60	2.5167	.98276	
	well-off	6	2.0000	1.09545	

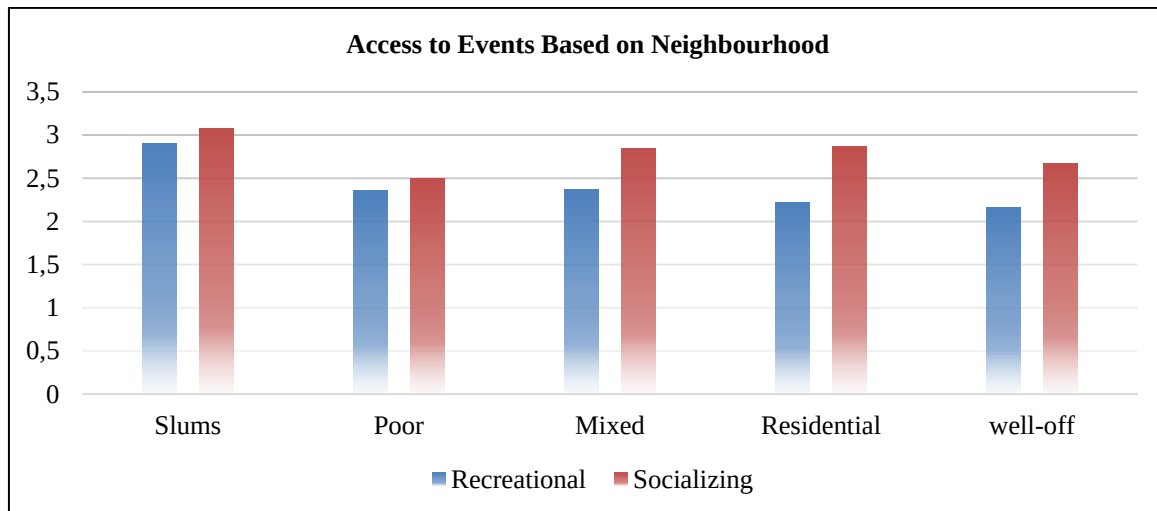


Figure 5.25. Access to activities based on the type of neighborhood

This one-way ANOVA examines the relationship between the type of neighborhood someone lives in (i.e., Slums, Poor, Mixed, Residential, and Well-off) and the mean rate of event cancellations for recreational and socializing activities.

- For recreational activities: The p-value is 0.041, which is less than the common alpha level of 0.05, suggesting that the type of neighborhood does indeed have a statistically significant impact on recreational activity cancellation. Looking at the means, slum residents report the highest cancellation mean (2.4118), while well-off individuals have the lowest (1.8333). This supports the hypothesis that people in precarious neighborhoods have higher cancellation rates for recreational travel compared to those in wealthier neighborhoods.
- For socializing activities: P-value is 0.331, greater than 0.05, suggesting that the differences between the neighborhoods' means are not statistically significant in terms of socializing activities cancellation. This implies that the type of neighborhood does not significantly influence social activity cancellation. However, it is still observable from the means that residents in the Slums report the highest cancellation mean (2.7763), while well-off individuals have the lowest (2.0000), which seems to support the hypothesis on a descriptive level.

Table 5.22. Cancellation rate of activities based on type of neighborhood

Cancellation of event		N	Mean	Std. Deviation	p-value
Recreational	Slums	85	2.4118	1.46624	.041
	Poor	58	2.1207	1.15588	
	Mixed	149	1.9799	.93339	
	Residential	47	1.8936	.98321	
	well-off	6	1.8333	.75277	
Socializing	Slums	76	2.7763	1.27121	.331
	Poor	58	2.5517	.97643	
	Mixed	157	2.6115	.97171	
	Residential	60	2.5167	.98276	
	well-off	6	2.0000	1.09545	

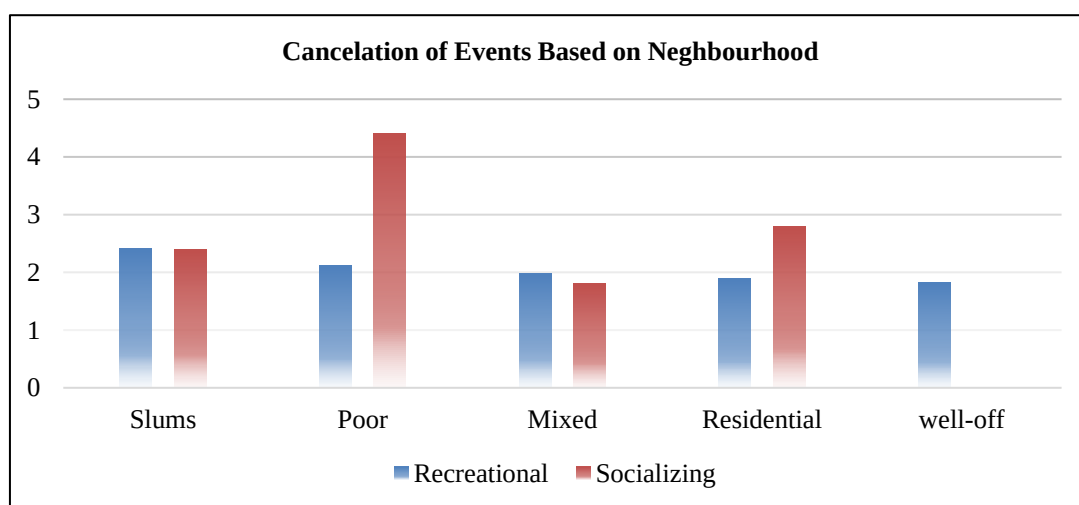


Figure 5.26. Activities cancellation rate based on type of neighborhood

In conclusion, the results depict that the type of neighborhood does not impact socializing activities ($p=0.331>0.05$) while the higher mean value for slum and poor neighborhoods indicates that having them as neighbors is a key reason for canceling participation in recreational activities. People agree that living in slums or poor neighborhoods is a reason for not attending recreational activities. This suggests that socializing activities are more accessible regardless of the type of neighborhood one resides in, while recreational activities are more difficult to access in poorer areas. This suggests that the physical environment and living conditions of the neighborhood play a significant role in recreational activities; and highlights the need for more equitable access to recreational activities for people living in slums or poor neighborhoods. Therefore, it is essential to create a safe and healthy environment for people to engage in recreational activities. This can be done by providing more public parks and recreational facilities, improving public transportation, and encouraging community involvement and engagement.

5.6.7. H7 - People living farther from their workplace are more dependent on public transport and participate less in OOH activities.

Commuting distance significantly affects individuals' reliance on public transportation and their likelihood of missing or canceling activities. Distance is a key factor in public transport usage in daily life.

This hypothesis explores the modes of transportation and distances that people travel for various activities. It compares two modes of transport: other means of transport (private vehicles, bicycles, walking, etc.) and public transport.

According to cross-tabulations, there is a significant relationship exists between distance and using public transport for work ($p=0.000<0.01$), religion ($p=0.000<0.01$), recreational activities ($p=0.001<0.01$), socializing ($p=0.000<0.01$), cultural events ($p=0.005<0.01$) and political events ($p=0.010$). On the other hand, there is no significant relationship between distance from the workplace to home and educational activities ($p=0.131>0.05$), healthcare activities ($0.233>0.05$), or shopping activities ($0.549>0.05$).

Table 5.23. Access to activities according to means of transport and distance

	Other means of transport	Public transport	p-value
Work			
0-0,5km	40	3	
0,5-1,5km	94	14	
1,5-5km	94	9	0.000
5-15km	62	32	
15-35km	23	17	
Education			
0-0,5km	3	5	
0,5-1,5km	8	9	
1,5-5km	11	17	
5-15km	11	23	0.313
15-35km	1	12	
Religious			
0-0,5km	40	2	
0,5-1,5km	96	11	0.000
1,5-5km	89	10	
5-15km	52	32	
15-35km	20	16	
Recreational			
0-0,5km	29	3	
0,5-1,5km	83	10	0.001
1,5-5km	71	15	
5-15km	53	27	
15-35km	23	11	

Table 5.23. (continued) Access to activities according to means of transport and distance

	Other means of transport	Public transport	p-value
Healthcare			
0-0,5km	36	3	
0,5-1,5km	88	18	0.233
1,5-5km	76	19	
5-15km	62	22	
15-35km	27	8	
Shopping			
0-0,5km	26	10	
0,5-1,5km	57	45	
1,5-5km	55	43	0.549
5-15km	49	33	
15-35km	21	16	
Socializing			
0-0,5km	36	3	
0,5-1,5km	54	44	
1,5-5km	53	35	
5-15km	52	26	0.000
15-35km	22	14	
Cultural events			
0-0,5km	29	5	
0,5-1,5km	55	42	
1,5-5km	51	36	
5-15km	48	30	0.005
15-35km	13	21	
Political events			
0-0,5km	27	3	
0,5-1,5km	43	34	
1,5-5km	34	21	
5-15km	23	25	0.010
15-35km	10	8	

- **Work:** People using other means of transportation, typically travel shorter distances for work, with the majority falling within the 0.5-1.5km and 1.5-5km categories. Conversely, those using public transportation, are more likely, to travel longer distances for work, with a significant number falling into the 5-15km and 15-35km categories. The P-value is 0.000, indicating the difference is statistically significant.
- **Education:** For educational purposes, both users of other transportation modes and public transport tend to travel between 5-15km, followed by 1.5-5km and 0.5-1.5km. Notably, very few individuals travel less than 0.5km or 15-35km for education. P-value=0.313 shows that the difference is not statistically significant.
- **Religious Activities:** Those using other forms of transport, tend to travel shorter distances (0.5-1.5km and 1.5-5km) for religious activities. Public transport users also fall into the 5-15km and 15-35km categories. The P-value is 0.000, indicating statistically significant differences.

- Recreational activities: People using other transportation modes typically travel shorter distances (0.5-1.5km and 1.5-5km) for recreational activities. Public transport users are more likely to travel 5-15km. P-value=0.001, indicating a significant difference.
- Healthcare: For healthcare purposes, people using other forms of transport usually travel between 0.5-1.5km and 1.5-5km. For public transport users, the most common distances are slightly longer, between 1.5-5km and 5-15km. The difference is not statistically significant (p-value: 0.233).
- Shopping: For shopping, there does not appear to be a significant difference in the distances traveled by those using other means of transport and those using public transport. Most people travel between 0.5-1.5km and 1.5-5km, irrespective of the mode of transport. The P-value is 0.549, indicating the statistical difference is not significant.
- Socializing: People using other transport modes, typically travel shorter distances (0.5-1.5km and 1.5-5km) for socializing. However, those using public transport are more likely to travel between 1.5-5km and 5-15km. The P-value is 0.000, indicating a significant difference.
- Cultural events: For cultural events, individuals using other forms of transport generally travel shorter distances (0.5-1.5km and 1.5-5km), whereas those using public transport are more likely to travel between 1.5-5km and 5-15km. A higher number of public transport users also falls into the 15-35km category. P-value=0.005 indicating a significant difference.
- Political events: People using other means of transportation usually travel shorter distances (0.5-1.5km and 1.5-5km) to political events. However, those using public transport are more likely to travel between 1.5-5km and 5-15km. P-value=0.010 suggests a significant difference.

The results suggest that the mode of transport used influences the distance traveled for different activities, with public transport users often traveling longer distances. Public transport is mainly used for activities such as work, religion, recreation, socializing, and cultural and political events. The study results suggest that public transportation is mainly used for leisure activities instead of essential activities such as education, healthcare, or shopping. However, it is not a preferred option for educational, healthcare, or shopping activities. This could have serious implications for people in need of access to essential services. Therefore, these findings highlight the need to improve public transportation access to essential services. Public transport can be an effective way to increase mobility and access

to important services, particularly for those in lower-income and urban areas. Furthermore, it can reduce the reliance on private vehicles and help reduce emissions in cities.

This hypothesis studies also the cancellation of OOH activities across different distances. The distances are split into six groups: 0-0.5km, 0.5-1.5km, 1.5-5km, 5-15km, and 15-35km, and a group of participants who did not declare their distance. The activities included job/income, education, religion, recreational/sport, healthcare, shopping, and socializing. For each category, the mean cancellation score, the standard deviation, and p-values have been statistically tested and the results are:

- **Job/Income:** There appears to be a significant difference in activity cancellation between those living at a distance of 0-0.5km and those further away. The mean cancellation score increases noticeably from about 1.75 for the first three distance groups (0-0.5km, 0.5-1.5km, 1.5-5km) to above 3.35 for the 5-15km and 15-35km groups. The increasing standard deviation indicates more variability in these groups. P-value=0.000, suggesting a significant differences.
- **Education:** A similar pattern is observed for education, with mean cancellation scores significantly higher for the two furthest distance groups. Again, the P-value=0.000 indicates a significant difference.
- **Religious:** The mean cancellation scores for religious activities are similar to the previous categories. Scores increase for those living further away. P-value=0.000 suggests significant differences between the groups.
- **Recreational/Sport:** This category also shows a pattern of increasing mean cancellation scores as the distance increases, with the highest scores for the furthest distance groups. The p-value is 0.000, indicating significant differences.
- **Healthcare:** Healthcare cancellation scores also increase with distance. The P-value is 0.000, suggesting that the cancellation rate difference is statistically significant.
- **Shopping:** Shopping cancellation scores rise with increasing distance, with a p-value of 0.000 which indicates significant differences between groups.
- **Socializing:** Like other categories, cancellation rates for socializing increase with distance. The p-value (0.000) suggests that there are statistically significant differences.

Table 5.24. Activities cancelation rate based on distance

Cancellation of activities		N	Mean	Std. Deviation	P values
Job/Income	0-0,5km	29	1.7586	.51096	0.000
	0,5-1,5km	94	1.8298	.66621	
	1,5-5km	78	1.7692	.66299	
	5-15km	68	3.4265	1.38560	
	15-35km	28	3.3571	1.36665	
	not declared	8	1.7500	.46291	
Education	0-0,5km	12	1.9167	1.08362	0.000
	0,5-1,5km	20	2.2500	.85070	
	1,5-5km	25	1.6800	.62716	
	5-15km	36	3.0556	1.28607	
	15-35km	21	3.4286	1.16496	
	not declared	2	1.0000	.00000	
Religious	0-0,5km	38	1.4737	.50601	0.000
	0,5-1,5km	101	1.4752	.70134	
	1,5-5km	86	1.6047	.92392	
	5-15km	90	3.2444	1.45580	
	15-35km	36	3.4444	1.29713	
	not declared	14	1.2143	.42582	
Recreational/sport	0-0,5km	32	1.9375	.71561	0.000
	0,5-1,5km	94	2.0000	.82956	
	1,5-5km	89	2.2697	.92643	
	5-15km	77	3.2208	1.28374	
	15-35km	35	3.4857	1.40108	
	not declared	12	1.4167	.51493	
Healthcare	0-0,5km	40	1.8500	.86380	0.000
	0,5-1,5km	101	1.9901	.81847	
	1,5-5km	94	2.0532	1.06121	
	5-15km	85	3.4941	1.25947	
	15-35km	37	3.1892	1.22106	
	not declared	14	1.6429	.74495	
Shopping	0-0,5km	37	2.3784	1.03686	0.000
	0,5-1,5km	104	2.6250	1.08106	
	1,5-5km	92	2.5000	1.07417	
	5-15km	82	3.2927	1.10541	
	15-35km	37	3.1622	1.21366	
	not declared	14	2.5000	.75955	
Socializing	0-0,5km	37	2.1892	.81096	0.000
	0,5-1,5km	89	2.7079	1.22662	
	1,5-5km	86	2.4070	1.11014	
	5-15km	77	3.3636	1.25561	
	15-35km	35	3.6286	1.28534	
	not declared	14	2.8571	1.29241	

In summary, ANOVA's results show that the higher mean values of the group who have more distance from home to the workplace are more likely to miss the OOH events related to work, education, education, religion, recreational activities, healthcare, shopping, and socializing. All the p-values in the significance column are $0.000 < 0.05$, which suggests a statistically significant relationship between distance and missing OOH activities.

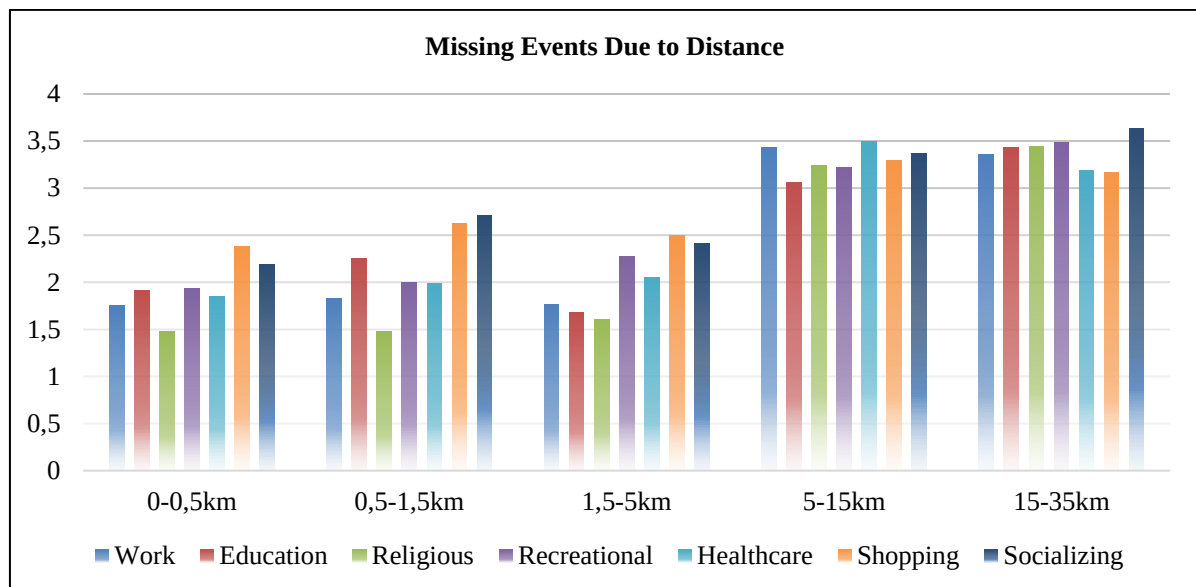


Figure 5.27. Activities cancelation rate based on distance

So, there are high chances of missing activities for those living far away from their workplace. The further someone lives, the more likely they are to cancel their activities. Therefore, distance is important for reducing OOH activities. Additionally, the cost of travel can be a factor, as people living further away from their workplace may have to bear higher costs for transportation. This has a high impact on the quality of life of individuals living far from their workplace.

5.7. Discussion of the Findings

This study illuminates the impact of TRSE in Abidjan on individuals' daily mobility and their participation in activities. Transportation and social exclusion are long-standing subjects of interest within urban and transportation research. Through an empirical investigation in Abidjan, this research contributes valuable insights into these discussions by evaluating ten hypotheses that explore various facets of this interplay. The ensuing discussion succinctly summarizes the key findings, contextualizes them within existing literature, and outlines implications and directions for future research.

Analysis of the socioeconomic and demographic characteristics of the respondents revealed that the majority were male (240, representing 59.7%), with 162 females participating. The age distribution showed that the youngest cohort (10-19 years) was the smallest group (8.2%), followed by those aged 20-29 years (24.1%), 30-39 years (23.9%), and 40-49 years

(24.4%). A significant portion of respondents had attained university-level education (192), whereas 87 participants were illiterate. The analysis of monthly income highlighted that income challenges predominantly affect the elderly (27 individuals), likely due to age-related factors. Notably, the largest group earning less than 200 USD comprised individuals aged 40-49 years, with an equal distribution among women and men (34 each).

The residential patterns of participants indicated a predominance of mixed, impoverished, and slum neighborhoods (171 residents). The commute distance for most participants ranged from 0.5 to 15 km. Furthermore, a significant number of respondents lacked personal transportation and lived in rented housing (198), followed by those who owned a vehicle yet opted for rental accommodations (103).

In Abidjan, women's participation in OOH activities is notably less frequent than that of men, reflecting gender theories posited in Hypothesis 1. These theories argue that social norms and expectations significantly shape women's daily routines and their engagement in OOH activities. A key observation from this study is that women, with certain exceptions, generally partake in fewer OOH activities than their male counterparts. The analysis indicates a pronounced gender disparity in TRSE, with women experiencing greater barriers to full participation in economic, social, and cultural activities due to higher levels of TRSE. This gender imbalance in opportunity aligns with Chamseddine and Ait Boubkr's (2021) findings, which suggest that the gendered division of labor impacts transportation access, limiting women's economic opportunities and increasing their reliance on public transport.

According to INS (2013), women appeared to be heavily disadvantaged as compared to men in almost all aspects of travel behavior. They participated less frequently in out-of-home activities. They particularly made higher walking trips and exhibited higher automobile reliance than men. Interviewee 1's experiences highlight how practical concerns, such as the impracticality of commutes far from main public transport routes and the unreliability of transport services, restrict women's access to job opportunities and additional educational or work activities *«I've had to turn down job offers that were too far from the main public transport routes because the commute would be impractical. The unreliability of transport also means I have to leave home much earlier to avoid being late, limiting my options for extra work or evening classes.»* Furthermore, significant issues like affordability, availability, and quality of public transportation emerge as crucial factors influencing

women's activity participation. Women reportedly face more barriers in utilizing public transport, including safety concerns, inadequate infrastructure, limited transport options, and restricted information access. Interviewee 4's concern over safety on public transport underscores the risks of poorly maintained vehicles, overcrowding, and potential for theft or harassment, further limiting women's mobility and activity choices *“Safety and security are major concerns for me and many other women I know. Instances of harassment on public transport aren't uncommon. These experiences range from verbal harassment to more threatening behavior. There's also the concern about pickpocketing in crowded buses. These issues significantly impact my sense of security and, at times, dictate my decision to avoid certain activities or events, especially if they require traveling late in the evening.”*

This research underscores the significant impact of gender on individuals' interactions with transportation systems and their participation in OOH activities. Gender and mobility are intricately linked, affecting each other in both overt and covert manners, as Hanson (2010) explains. The mobility system can enhance independence and alter existing gender power structures, whereas restricted mobility reinforces women's subordinate positions, as noted by Adeel and Yeh (2018).

The study's findings shed light on the gendered dimensions of transportation and social exclusion in Abidjan, revealing substantial gender disparities in public transport access. Echoing Gupta et al. (2018), gender-based transportation inequalities are particularly pronounced among women in urban settings, with significant obstacles to accessing public transport leading to TRSE. The testimonies from Interviewees regarding the impacts of daily public transport use on their health and safety further illustrate the gender gap in mobility and activity participation, aligning with the broader literature on gender differences in transportation (Hanson and Johnston, 1985; Law, 1999). Cultural norms, caregiving responsibilities, and safety concerns significantly influence women's mobility decisions, underscoring the need for addressing these gender-specific challenges in transportation policy and planning (Lucas, 2012).

Increasing monthly income positively correlates with the frequency of OOH activities, while individual poverty diminishes participation in such activities. The analysis reveals a clear link between monthly income levels and engagement in a wide range of activities, including employment, education, religious practices, recreation, healthcare, shopping, socializing,

and attendance at cultural and political events. Specifically, the findings indicate that individuals with lower monthly incomes are less inclined to engage in OOH activities due to financial constraints. This observation corroborates Hypothesis 2, positing that poverty impedes activity participation. Poverty adversely affects the regularity of OOH activities by limiting access to transportation, compelling individuals to forgo these activities in the absence of affordable transport options. Household spends an average of CFAF 1,075 (US\$1.82) per day and "lose" more than 3 hours commuting (INS, 2013). As articulated by Interviewee 6: *"For someone with a limited income, the costs associated with public transport can take up a significant portion of my monthly budget." ... "My family and social life are significantly impacted by the transportation challenges. Participating in social activities, visiting family, or attending important events can be difficult. Often, I have to decline invitations to gatherings or community events because the cost or the logistical challenges of getting there and back are too daunting."*

While the impact of poverty on work-related and vacation activities appears to be less pronounced, it significantly deters participation in politics, religious observances, shopping, socializing, and cultural events. This pattern aligns with social exclusion theories, which argue that financial constraints can restrict an individual's ability to engage in various community and societal activities. Moreover, the lack of resources and accessible transportation can deter individuals from engaging in social events and opportunities. The scarcity of transportation options disproportionately affects vulnerable populations, curtailing their access to activities and perpetuating poverty. This underscores the importance of affordable transportation as a catalyst for active involvement across different socioeconomic domains, echoing prior research on the influence of income on activity participation. Notably, in developed contexts, studies have consistently shown that income levels affect mobility and the breadth of activity engagement (Pucher, 2004). In developing regions, such as Côte d'Ivoire, limited financial resources significantly restrict activity participation, highlighting economic barriers as a key factor (Fujii and Van, 2009).

Ownership of a household and vehicle is associated with a higher frequency of participation in OOH activities. Hypothesis 3 suggests that individuals who own both a household and a vehicle partake in a broader array of activities more frequently than those lacking personal transportation. The availability of private transportation options significantly boosts independence and mobility, facilitating easier participation in diverse events.

Interviewee 8 illustrates this point, noting, “*My ability to drive a personal vehicle or take a taxi facilitates attending family and social events across Abidjan without much restriction.*” ... ” *I'm able to commute across different parts of the city...* ” This observation echoes broader research findings linking vehicle ownership to increased activity engagement, notably in social, political, cultural, recreational, healthcare, shopping, and socializing domains (Mackett, 2014). Vehicle ownership is also acknowledged for offering mobility freedom, thereby broadening owners' engagement in activities, and highlighting the influence of socioeconomic status on transportation mode choices.

However, the impact of vehicle ownership on education-related activities is minimal, possibly due to other prevailing barriers such as access or scheduling challenges that vehicle ownership alone cannot address. This perspective aligns with Scheiner and Holz-Rau (2007), who argue that car ownership significantly enhances personal mobility and, consequently, the likelihood of engaging in various activities. In the context of Abidjan, where homeownership is less common compared to rental arrangements, the findings signal an urgent need for policy interventions, as the General Abidjan Area (GAA) is expected to expand in the coming years (Morisset, 2019).

Conversely, economic theories suggest that individuals without personal vehicles may prioritize essential activities like work and education, regardless of their ownership status, highlighting the nuanced relationship between vehicle ownership and participation in work or education-related events (Freedman et al., 2016). This discrepancy underscores the broader principle of transport equity, advocating for equal access to all activities for all citizens. Ensuring equitable transportation facilities and services is critical for fostering inclusive participation in OOH events across diverse community segments.

Hypothesis 4 investigates the frequency of public transportation use among specific groups—namely the elderly, women, individuals with disabilities, those in economic hardship, and children—compared to others. The application of Social Vulnerability Theory (Laparra et al., 2021) offers insights into these findings, acknowledging the nuanced patterns of public transport utilization among these groups. Despite evidence suggesting that vulnerable populations often depend more heavily on public transport (Lucas, 2012), challenges such as cost and accessibility may curtail their participation in certain OOH activities. For instance, Interviewee 4 shared, “*My reliance on public transport has affected*

my social and family life. There are numerous social gatherings, family events, and even essential errands that I've had to miss out on due to concerns about commuting back home safely afterward. It often feels like a choice between maintaining social connections and ensuring personal safety."

Vulnerable groups encounter unique obstacles in accessing transportation due to physical limitations, financial constraints, or inadequate infrastructure. These barriers hinder their ability to fully engage in societal interactions, leading to restricted participation in OOH activities. Addressing the transportation needs of these groups demands an inclusive strategy that considers affordability, accessibility, and inclusivity. Interviewee 7 emphasized the importance of public transport affordability, stating, *"The affordability of public transport is crucial for me, as my limited income does not allow for the luxury of more comfortable, private transport options."*

Hypothesis 5 posits that individuals with higher educational attainments are more likely to utilize private cars than those with lower educational levels, a claim substantiated by our findings. These results corroborate existing research that establishes a link between educational level and the propensity for vehicle ownership and use (Cao, 2008). Furthermore, the hypothesis examines the correlation between educational attainment and the likelihood of deferring or foregoing social, religious, and professional engagements. Data indicate that individuals with lower educational backgrounds are more inclined to skip such activities, suggesting that education not only influences transportation choices but also broader patterns of social participation (Ross and Wu, 1995).

The tendency of well-educated individuals to own vehicles could be attributed to higher income levels, yet this observation may also intersect with factors like residential location and employment type. The notable preference for automobile use among university graduates underscores the role of education in shaping transportation behaviors. This observation aligns with the status consumption theory, which argues that higher educational achievements may lead to valuing private vehicle ownership as a marker of success and social position (Laparra et al., 2021). Such findings highlight the connection between education and the utilization of private cars for daily commuting.

These distinctions likely mirror variances in lifestyle, health considerations, and employment demands across different educational strata. The concept of educational stratification suggests that higher educational attainment grants individuals increased socio-cultural capital, facilitating broader activity participation and adaptability to dynamic circumstances. Interviewee 7 highlighted the challenges posed by public transport dependency, emphasizing the adverse effects on health and well-being due to the stress and economic burden of commuting: *“The stress and physical demands of relying on public transportation, combined with the financial strain of commuting costs, impact my overall health and well-being. The cumulative effect of navigating these daily challenges can be quite taxing.”* This relationship between transport mode choice and socioeconomic factors, including income and education level, is further validated by research from Cao et al. (2009), demonstrating the significant impact of these variables on transportation preferences.

Hypothesis 6 investigates the disparities in social and recreational activity participation between individuals living in precarious neighborhoods such as (Port-Bouët) and those from affluent areas. The analysis reveals a pronounced association between the type of neighborhood and engagement in these activities, with significantly lower participation rates observed among residents of disadvantaged and slum areas. The hypothesis further probes the extent to which transportation accessibility challenges are more acute in underprivileged neighborhoods compared to wealthier ones. The findings indicate that residents of slums and impoverished communities (Adjouffou in Port-Bouët; or Clouetcha in Abobo) disproportionately suffer from public transportation inaccessibility, fuel shortages, and prohibitive trip costs. This disparity underscores prior research indicating that transportation services are often unevenly distributed across neighborhoods, with poorer areas typically receiving less coverage (Lucas, 2012). The concept of environmental justice provides a framework for understanding these disparities, highlighting how the inequitable distribution of resources and services contributes to transportation disadvantages among marginalized populations (Laparra et al., 2021). Nonetheless, the quality of infrastructure and public policy decisions may also play critical roles in these observed differences.

The theory of social capital suggests that individuals in affluent neighborhoods benefit from greater access to resources, social networks, and recreational opportunities, thereby enabling higher levels of activity participation (Laparra et al., 2021). This is consistent with findings that neighborhood characteristics significantly influence how people engage in various

activities (Kawachi and Berkman, 2003), with factors such as safety, the quality of public spaces, and the availability of amenities playing decisive roles. This corroborates research by Farrington and Farrington (2005), which indicates that neighborhood conditions have a substantial impact on activity engagement. Such insights underscore the importance of urban planning in fostering social participation and inclusion, emphasizing the necessity of revitalizing disadvantaged neighborhoods and enhancing their connectivity. The share of the informal sector, consisting of Gbaka, taxis, and woro-woro, increased from 68% of public transport trips in 2013 to more than 85% in 2019 (the woro-woro and the Gbaka alone account for 77% of Abidjan's daily public transport trips) (INS, 2013).

Interviewee 6 highlights the potential transformative impact of improved public transportation infrastructure on the lives of low-income residents, stating, *"Improvements in public transportation infrastructure could dramatically improve the lives of low-income residents like myself. Affordable, reliable, and safe public transport options would not only facilitate better access to employment opportunities but also enhance participation in social and community activities, reducing the risk of social exclusion. Additionally, targeted subsidies or reduced fares for low-income individuals could help alleviate the financial burden of commuting."* underscoring the pivotal role of inclusive transportation policies in promoting equitable social participation.

Hypothesis 7 explored the correlation between the commute distance and the frequency of postponing or canceling OOH activities. The findings indicate a clear trend: individuals living further from their workplaces tend to miss a greater number of OOH activities. The study underscores the link between longer travel distances to work and reduced usage of public transportation for attending job-related, religious, leisure, social, cultural, and political events. An individual living in Abobo Akekoi (North) travels almost 25 Km to work in Cocody Abatta (East) Interviewee 9 shared, *"The distance from my workplace limits my employment options and affects my participation in professional development activities. I have had to decline opportunities for additional training or networking events that do not align with public transport schedules or would require late travel."*

Residents in outlying neighborhoods are the most adversely affected because their trips are longer (78 minutes per trip compared to a city-wide average of 33 minutes) (INS, 2013). This observation aligns with the spatial mismatch hypothesis, suggesting that those residing

further from work may depend more heavily on public transportation due to its affordability and the absence of alternatives. This reliance is contextualized within the broader discussion of "commuting stress," as posited by Stutzer and Frey (2008), highlighting the detrimental effects of lengthy commutes on individuals. Interviewee 9 elaborates, *"My commute involves a lengthy journey on public transportation, taking up to two hours each way. This includes walking to the nearest bus stop, waiting for the bus, and sometimes transferring to another bus or a shared taxi to reach my workplace. The long commute is a significant part of my daily routine."*

Long commutes are associated with heightened stress, increased fatigue, and diminished time for personal or social activities (Stutzer and Frey, 2008). The theory of time-space constraints explains these findings, positing that longer commutes impose time-related challenges that restrict individuals' ability to participate in various activities beyond work. This theory invites further investigation into the intricate dynamics of this relationship, taking into account variables such as modes of transport and work schedules.

This study significantly enhances our understanding of the complex relationship between social exclusion and transportation in Abidjan. Through a meticulous analysis of seven research hypotheses, the research offers a comprehensive overview of how transportation dynamics contribute to social exclusion in the city. Each finding sheds light on the intricate ways in which socio-economic status, gender, education, and geographic location intersect with transportation issues, influencing patterns of social exclusion.

By corroborating and expanding upon existing literature, this research not only reaffirms known correlations but also uncovers new insights into the socio-economic determinants of transportation behaviors among Abidjan's residents. These insights contribute to the broader discourse on transportation and social exclusion, offering valuable perspectives for policymakers, urban planners, and stakeholders interested in mitigating the impacts of TRSE. The findings highlight the importance of considering a multifaceted approach to transportation policy that addresses the varied needs of the city's diverse population, aiming to foster a more inclusive urban environment.

5.8. Discussion of TRSE Dynamics in Developing Countries: Comparative Analysis between Pakistan, Mexico, South Africa, Nigeria, and Côte d'Ivoire

Mobility is a central concern for the development of cities, whether from the perspective of the economy, the environment or social justice. Poorer public transport further isolates the urban poor from basic services and economic opportunities. By connecting producers and consumers, transport enables economic activity and improves the access to essential services of the residents (Cheba, S., and Saniuk, A., 2016). In contrast, inadequate public transportation access contributes to TRSE and, in turn, disproportionately affect low-income residents, and restrict the potential well-functioning cities (Church et al., 2000), limiting access to opportunities for job, education, healthcare and essential services.

This section presents a TRSE comparative analysis in five key developing countries (5 case studies): Pakistan, Mexico, South Africa, Nigeria, and Côte d'Ivoire. This part of research aims to offer actionable recommendations for policymakers in the Global South, but also provide a guide for future research by identifying common challenges and what works based on the experience in those regions across continents.

5.8.1. Common challenges across countries

Gender disparities

Women in Pakistan suffer severe mobility problems, grounded predominantly in safety fears, socio-cultural constraints and inadequate transport infrastructure, which not only inflates transportation costs, but also constrains broader participation in social and economic life (Iqbal et al., 2020). Similarly, the same is true for women in urban Mexico context, which shows there is a need for a change in the type of transportation models and policies to be developed with a gender perspective.

The prevalence of crime and harassment in public transportation in South Africa discourages women from utilizing these services, resulting in fear-driven exclusion and restricting their ability to move freely. Nigerian women, particularly those residing in Lagos, encounter safety apprehensions and exorbitant transportation expenses, which impede their ability to avail themselves of vital services. Women in Abidjan, Côte d'Ivoire, have significant limitations on their ability to move around due to societal norms and safety issues. As a

result, they often have to postpone trips and are less likely to engage in activities outside of their homes. These difficulties highlight the widespread existence of gender inequalities in transportation across various cultural and geographical settings.

Economic burden

Low-income households in many countries bear a disproportionate cost burden from transportation, which worsens their vulnerability and restricts their access to key services.

High transportation costs in Pakistan have a major impact on low-income families, limiting their ability to access essential services and worsening their economic vulnerability (Adeel et al., 2016). Territorial disparities in Mexico lead to significant travel costs and lengthy travel durations for those residing in outlying areas, exacerbating their already constrained financial resources (Finck Carrales, 2022). Transportation costs in South Africa significantly reduce the financial resources of low-income households, therefore restricting their ability to reach work opportunities, educational institutions, and healthcare facilities (Lionjang and Venter, 2022).

Nigeria encounters comparable obstacles, as insufficient and inadequately designed transportation infrastructure results in substantial time and financial costs for citizens, exacerbating economic inequalities. In Côte d'Ivoire, the combination of expensive transportation and limited public transport options imposes a significant financial strain on low-income households, frequently resulting in a substantial portion of their income being allocated to transportation expenses and restricting their capacity to access essential services. It is crucial to implement specific measures to enhance the affordability and accessibility of transportation for individuals with low incomes.

Spatial exclusion

Spatial exclusion is a significant issue affecting various countries, specifically limiting the availability of vital services and opportunities for underprivileged communities.

Peripheral urban areas in Pakistan experience significant transportation disadvantages, which restrict the people's ability to enjoy social and recreational activities (Adeel et al., 2016; Iqbal et al., 2020). In Mexico, there is a problem of housing and job locations being far apart,

which requires the need for improved public transportation services to connect these areas (Finck Carrales, 2022; Colmenero-Fonseca et al., 2023; Lizárraga et al., 2023). The enduring effects of apartheid in South Africa impede the ability of low-income communities located far from economic centers to access resources, hence sustaining social exclusion (Jennings et al., 2018; Phosho and Gumbo, 2022; Lionjang and Venter, 2022).

In Nigeria, the expansion of cities and unequal distribution of transportation infrastructure worsen social exclusion, creating challenges for peri-urban inhabitants to reach necessary services (Agunbiade and Olajide, 2016). The transport infrastructure in Côte d'Ivoire is insufficient, which greatly affects the ability of vulnerable populations to move about. This increases their exclusion from certain areas and limits their ability to reach essential services and economic opportunities. These examples highlight the urgent requirement for the integration of urban and transport planning to reduce spatial exclusion and improve accessibility for all inhabitants.

The table below provides a summary and comprehensive overview of the various aspects of TRSE in each of the studied five countries, highlighting key challenges and insights:

Table 5.25. Key challenges and insights of TRSE in Pakistan, Mexico, South Africa, Nigeria, and Côte d'Ivoire.

Aspect	Pakistan	Mexico	South Africa	Nigeria	Côte d'Ivoire
Gender Disparities	Safety concerns, cultural norms, and inadequate infrastructure restrict women's mobility.	Urban women face similar issues, highlighting the need for gender-sensitive policies.	High crime rates and harassment deter women from using public transport.	Women face significant transport challenges, including safety concerns and high costs.	Women's mobility is restricted by societal conventions and safety concerns, leading to frequent trip cancellations.
Economic Burden	High transportation costs disproportionately affect low-income households.	Territorial inequalities lead to high commuting costs and long travel times for peripheral residents.	Transport costs consume a large portion of low-income households' budgets, limiting access to services.	Poorly planned transport infrastructure increases time and financial costs for residents.	High transportation costs and poor public transport availability significantly impact low-income families.
Spatial Exclusion	Peripheral urban areas face transportation disadvantages, limiting activity access.	Spatial mismatch between housing and employment requires expanded public transport.	The legacy of apartheid creates spatial barriers for low-income communities far from economic hubs.	Urban sprawl and regional transport disparities contribute to social exclusion for peri-urban residents.	Inadequate transport infrastructure exacerbates spatial exclusion, restricting vulnerable group's access to services.

5.8.2. Successful strategies

Inclusive and gender-sensitive transport policies

To effectively address Transportation-Related Social Exclusion (TRSE), it is necessary to establish transport policies that are inclusive and sensitive to gender, specifically designed to meet the requirements of excluded groups. Gender-sensitive transport policies and enhanced public transport infrastructure are crucial in Pakistan for reducing TRSE and promoting social inclusion, as highlighted by Adeel et al. (2016) and Iqbal et al. (2020).

The Inclusive Urban Transport (TUI) model in León, Mexico, serves as a prime example of effective inclusive transportation solutions. It achieves this by incorporating public, private, and civil society entities to improve mobility for individuals with disabilities and economically marginalized groups (Colmenero-Fonseca et al., 2023). In South Africa, engaging marginalized communities in the development and execution of transportation policy guarantees that their unique requirements are taken into account, promoting a feeling of ownership and empowerment (Phosho and Gumbo, 2022; Luke, 2024). The paratransit services integration with mainstream public transport in Nigeria has the potential to greatly expand the network and enhance the quality of service, therefor increasing accessibility for all urban residents (Cheba and Saniuk, 2016).

Similarly, in Côte d'Ivoire, it is crucial to implement specific measures aimed at reducing the disparity between genders in transportation. This can be achieved by offering secure, dependable, and cost-effective transportation alternatives. These interventions are vital for enhancing women's ability to move around and guaranteeing their ability to reach essential services and economic prospects (Bande and Kaplan, 2023). These techniques emphasize the significance of implementing inclusive and gender-sensitive policies to establish fair and easily accessible transportation systems.

Integrated urban planning

Effective and comprehensive urban planning is essential for tackling TRSE by establishing harmonious and easily accessible urban settings. According to Khan et al. (2020), in Pakistan, focusing on psychological and social issues as well as resolving limitations in the

neighbourhood can highly improve public transport accessibility and decrease social exclusion among the elderly. Mexico's strategy encompasses the implementation of comprehensive urban planning and transportation strategies that establish various centers, hence decreasing travel times and fostering social fairness (Lizárraga et al., 2023).

Integrated transport and comprehensive urban planning are both crucial in South Africa for creating cohesive urban settings that enhance accessibility to economic opportunities and services (Jennings et al., 2018; Phosho and Gumbo, 2022). Similarly, in Nigeria, the implementation of comprehensive strategies that synchronize transport, land use, and social policies can promote more interconnected and inclusive cities (Agunbiade and Olajide, 2016). Comprehensive urban mobility planning encompassing cost, safety, and reliability is crucial in Côte d'Ivoire for reducing TRSE and ensuring fair access to services and opportunities (Bande and Kaplan, 2023). The significance of interconnected transport infrastructure with wider urban development objectives to improve social inclusion and accessibility is emphasized by these integrated approaches.

5.8.3. Major insights from comparative analysis

The comparative analysis of TRSE across different countries reveals several significant findings.

An important concern is the conflict between accessibility and efficiency aspects of transportation plans. Frequently, policies place a higher importance on the effectiveness of transportation rather than the ability of all individuals to easily access transportation services. This situation can result in marginalized groups being socially excluded if they are unable to access efficient transportation options.

Another notable discovery is that high transportation costs and safety apprehensions are widespread obstacles to urban mobility, disproportionately impacting women and low-income households. The presence of economic and safety concerns hinders the ability to access vital services, hence perpetuating a cycle of social exclusion and economic vulnerability.

Moreover, active public participation and community engagement are crucial for the development of effective and inclusive transport policies that cater to the specific requirements of all community members. This inclusive method guarantees that transportation solutions are fair and customized to the circumstances of underprivileged communities, promoting a feeling of ownership and empowerment. These observations emphasize the necessity of implementing equitable and comprehensive transportation strategies to alleviate TRSE and foster social inclusion.

The table below provides a comprehensive overview of the various aspects of TRSE in each of the studied five countries, highlighting key strategies, insights, recommendations, implications, and areas for future research:

Table 5.26. Key strategies and recommendations to mitigate TRSE in the selected five developing countries

Aspect	Pakistan	Mexico	South Africa	Nigeria	Côte d'Ivoire
Inclusive Transport Policies	Gender-sensitive policies and improved infrastructure to mitigate TRSE.	The Inclusive Urban Transport model in León shows success for disabled and economically disadvantaged groups.	Engaging marginalized communities in transport policy planning ensures specific needs are addressed.	Integrating paratransit with mainstream public transport enhances coverage and service quality.	Targeted interventions for safe, reliable, and affordable transport to improve vulnerable group's mobility.
Integrated Urban Planning	Address psychosocial factors and neighborhood constraints to enhance accessibility.	Multi-centralities in urban planning reduce commuting times and promote equity.	Integrated policies create cohesive environments with better access to economic opportunities and services.	Holistic strategies align transport, land use, and social policies for connected cities.	Comprehensive mobility planning addressing affordability, safety, and reliability to mitigate TRSE.
Major Insights	Prioritization of efficiency over accessibility leads to exclusion.	High costs and safety concerns limit mobility, especially for women and low-income households.	Inclusive planning and community engagement are vital for effective policies.	Safety concerns and high transport costs are significant barriers.	Community involvement in planning processes is essential for sustainable solutions.
Actionable Recommendations	Develop gender-sensitive and inclusive transport policies.	Create integrated policies addressing transport and housing issues.	Invest in affordable public transport to cater to low-income communities.	Enhance the safety and affordability of transport services.	Involve communities in planning to ensure tailored transport solutions.
Practical Implications	Improved access to services and economic opportunities for marginalized communities	Reducing transport costs promotes upward social mobility.	Community engagement leads to sustainable and effective transport policies.	Holistic strategies foster connected and inclusive urban environments.	Safe and reliable transport enhances social inclusion and economic opportunities for vulnerable groups.
Future Studies	Longitudinal studies on TRSE impact.	Explore the role of emerging technologies like MaaS in improving mobility.	Conduct cross-cultural comparative studies to find effective strategies and solutions.	Assess the long-term effects of transport policies on social inclusion.	Identify universally effective strategies and context-specific solutions for TRSE.

5.8.4. Actionable recommendations

For policymakers

Policymakers can effectively reduce the negative impacts of TRSE by implementing several practical proposals. First and foremost, it is essential to implement inclusive transport policies. These transportation systems should be sensitive to gender and built to overcome physical as well as psychological obstacles to OOH activities, guaranteeing that every social group, especially women and vulnerable people, may easily and safely access reliable public transportation.

Furthermore, it is imperative to integrate urban and transport planning. Policymakers should develop policies that effectively tackle both transportation and housing concerns, thus reducing spatial discrepancies and enhancing accessibility. Implementing this comprehensive strategy can decrease travel times and improve the general standard of living for inhabitants, particularly those living in outlying areas.

Finally, it is crucial to invest in affordable public transportation. Increasing the quality of public transportation services, implementing additional safety precautions, and guaranteeing affordability will effectively meet the requirements of socially disadvantaged communities. These investments have the potential to reduce the financial stress caused by transportation expenses and enhance the availability of crucial services and opportunities such as employment, education, and healthcare. These ideas offer a strategic framework for policymakers to promote social inclusion and ensure fair and equal access to transportation.

Practical implications

The study has significant and broad practical implications for policymakers. Implementing the suggested measures can greatly promote social inclusion by enhancing excluded communities' access to vital services and economic opportunities.

By giving priority to inclusive and accessible transportation options, policymakers might help reduce the disparity between socio-economic groups, therefore enhancing the overall quality of life for disadvantaged communities.

In addition, by decreasing transportation expenses and enhancing accessibility, it is possible to ease financial hardships faced by low-income households, so fostering upward mobility and economic empowerment. Accessible and reliable options for transportation can facilitate the ability of these groups to reach employment, education, and healthcare services, thus promoting their economic progress.

The inclusion of affected populations in the planning process guarantees that transportation solutions are customized to meet their particular requirements, promoting a feeling of ownership and empowerment.



6. CONCLUSION AND RECOMMENDATIONS

6.1. Conclusion

This thesis has meticulously explored the complexities of TRSE in Abidjan and its surrounding areas, revealing the profound impact of transportation access and usage patterns on individuals' engagement in daily life. Through an extensive investigation into the transportation dynamics within Côte d'Ivoire, this research has highlighted the variability in transportation behaviors, activity participation, trip cancellation rates, transportation mode preferences, and the challenges faced in accessing public transportation across the urban environment of Abidjan. The collection of data through a detailed literature review, national survey analyses, and a carefully structured questionnaire survey across various locations with differing levels of public transport access has provided a comprehensive foundation for this study.

Reflecting upon the hypotheses presented, the research engaged a broad spectrum of theoretical perspectives to examine the relationship between public transportation systems and perceptions of social exclusion among residents of Abidjan. A key aspect of this inquiry was to assess the validity of these hypotheses in light of the empirical evidence obtained.

The study found that vulnerable demographic groups, including low-income residents, disabilities, women, and residents of peripheral or informal settlements, are especially impacted by TRSE. They face a multitude of challenges, from issues of affordability and accessibility to safety concerns, which underscore the intricate link between transportation inequalities and wider social vulnerabilities. These barriers significantly impede their access to employment, education, healthcare, and social activities, exacerbating socio-economic divisions.

The consequences of TRSE on individual mobility and societal participation in Abidjan are stark. Transportation barriers not only restrict personal freedom but also restrict economic growth and deepen social inequities. The absence of adequate transportation infrastructure and services fosters a cycle of poverty and exclusion, emphasizing the critical need for holistic policy solutions and urban planning initiatives.

To effectively address TRSE in Abidjan, a comprehensive approach encompassing policy reform, infrastructure enhancement, and community engagement is essential. The implementation of policies and urban planning strategies aimed at improving the affordability, accessibility, safety, and reliability of public transport is imperative. These efforts should be designed to tackle the root causes of TRSE and foster a more inclusive approach to urban mobility. Recommendations call for the formulation of inclusive transportation policies that account for the needs of diverse population groups, investments to boost public transportation infrastructure and service efficiency, and safety initiatives to safeguard all users, with a particular focus on the most vulnerable.

Furthermore, the engagement of communities and the adoption of participatory planning processes are vital in pinpointing the specific requirements of impacted populations and crafting responsive intervention strategies. Through constructive dialogue among policymakers, transportation providers, and community members, it is possible to create a more equitable transportation framework that supports the socio-economic prosperity of all of Abidjan's inhabitants.

In conclusion, this research presents a detailed analysis and recommendations regarding the intricacies of daily travel behavior across various demographic categories, such as gender, income, vulnerability, age, and location. These insights contribute to a deeper understanding of TRSE in Abidjan, characterizing it as a multifaceted phenomenon rooted in gender, economic, and spatial disparities.

This thesis significantly enhances our understanding of TRSE, portraying it as a complex issue intertwined with gender differences, economic disparities, and spatial segregation. The findings highlight the urgent need for targeted interventions and policy measures aimed at improving transportation access and mitigating the broad effects of social exclusion. This work not only enriches the academic discourse on urban mobility and social equity but also sets a foundation for future research and policy development aimed at promoting more inclusive urban spaces.

In summary, this thesis emphasizes the critical need for a holistic and inclusive strategy to combat TRSE in Abidjan. By addressing the intertwined challenges of socio-economic status, geographic location, and transportation inequalities, Abidjan can progress towards a

future where urban mobility enables rather than restricts access to opportunities and participation in society. Achieving this goal demands a steadfast commitment to equity and inclusivity, ensuring that urban development benefits extend to all residents, irrespective of their economic standing or geographical position.

6.1.1. TRSE in Abidjan as a gender-based exclusion

This thesis marks a pioneering effort to dissect gender disparities in daily transportation use within Côte d'Ivoire; a subject scarcely explored in other African cities. Amid a backdrop of data scarcity and limited political will, this research endeavors to illuminate the intricate patterns of daily mobility between genders, offering insights crucial for fostering greater inclusivity and enhancing women's access to opportunities.

Our findings reveal stark gender-based barriers in accessing public transportation, leading to TRSE. Women in Abidjan demonstrate lower participation in OOH activities compared to men, signaling constrained mobility and diminished access to economic opportunities, thereby exacerbating gendered transport exclusion. This phenomenon is not isolated to women; elderly individuals, those with disabilities, and low-income groups also encounter significant social and economic hurdles in public transport access. The daily mobility patterns further underscore societal gender roles, with men predominantly engaging in job and education-related travel, whereas women's travel is more often oriented towards shopping and healthcare, likely influenced by the traditional division of labor and societal expectations.

The research underscores a pronounced gender disparity in the cancellation of activities due to transportation challenges, with women disproportionately affected. This not only impacts women's quality of life and opportunities for professional and personal development but also reflects the broader societal implications of gendered transportation barriers. Issues of accessibility, such as the lack of supportive infrastructure, amplify the challenges faced by women and vulnerable groups, limiting their public transportation usage.

Interestingly, while cost remains a critical concern for both genders in accessing public transportation, differences emerge in priorities; women express heightened concerns about the availability and reliability of transport services. This divergence hints at the deeper layers

of gendered experiences in urban mobility, echoing Bande and Kaplan's (2023) observations on the nuanced impacts of transportation accessibility on women.

Addressing these disparities requires a multifaceted approach, focusing on creating safer, more reliable, and accessible public transportation options for women. This entails not only infrastructural improvements but also a holistic consideration of sociocultural, economic, and safety factors that disproportionately impact women's mobility.

The gendered participation in OOH activities, as highlighted in this thesis, aligns with Hanson's (2010) analysis of women's complex transportation needs and the barriers they face. However, as Adeel and Yeh (2018) caution, the full scope of immobility's effects, especially its long-term impact on access to essential services and health, requires further exploration.

In essence, this thesis lays the groundwork for a more inclusive understanding of urban mobility in Abidjan, spotlighting the urgent need for gender-sensitive transportation policies. By addressing these disparities, we can move closer to equalizing opportunities across genders, fostering a more inclusive and equitable urban landscape.

6.1.2. TRSE as an income, education, and vehicle ownership-based exclusion

In the Greater Abidjan Area, income emerges as the principal factor influencing TRSE. Through comprehensive surveys and interviews with stakeholders, poverty and low income were identified as pivotal barriers to mobility, affecting the ability of individuals to make decisions about their movement within the city. Lower-income individuals often forgo participation in a broad array of activities—including education, religious gatherings, healthcare appointments, shopping, and social, cultural, and political events—due to financial constraints.

This research delineates a pronounced correlation between income levels and the frequency of participation in OOH events, such as work and educational activities. Interestingly, individuals from low-income backgrounds are more engaged in work-related and educational pursuits, yet their participation in recreational and other non-essential activities is markedly low. This pattern underscores a widespread understanding that engagement in

most events incurs expenses, limiting participation to those with adequate financial means. These insights not only align with but also expand upon previous findings by Currie and Delbosc (2011), offering a nuanced view of how income disparities affect access to diverse urban experiences.

Moreover, the study reveals that vehicle ownership significantly enhances engagement in a variety of activities, particularly religious and healthcare-related ones, underscoring the role of personal transport in facilitating easier access to these essential services. However, it's noteworthy that vehicle ownership does not universally increase participation across all activity types, suggesting the need for nuanced, targeted solutions to address specific mobility challenges faced by different population segments.

Extending the inquiry to educational attainment, our findings suggest that the level of education not only influences overall transportation use but also the choice of transportation modes. Individuals with higher education levels predominantly utilize private cars, reflecting their higher income brackets and vehicle ownership status. Education significantly impacts the likelihood of missing or canceling various activities, with notable differences observed in the propensity to forgo educational, religious, healthcare, and social events among those with varying educational backgrounds. This aligns with findings from Bocarejo and Oviedo (2012), highlighting education as a crucial determinant of mobility patterns and activity participation.

In summary, this thesis uncovers the intricate interplay between income, vehicle ownership, and education in shaping mobility and access to activities within the Greater Abidjan Area. By identifying these critical determinants of TRSE, the research provides a foundation for developing targeted interventions aimed at enhancing urban mobility and ensuring equitable access to the city's socioeconomic opportunities for all residents.

6.1.3. TRSE as a location-based exclusion

Urban sprawl is an unmistakable trend impacting both developed and developing countries, a phenomenon vividly illustrated by the expansion of the Greater Abidjan Area. As residents find themselves living increasingly farther from the city's heart, Plateau, the urban layout—defined by the Ebrié Lagoon and the Banco Forest—presents unique challenges and

opportunities for urban connectivity and mobility. The dichotomy between the southern industrial zones (e.g., Treichville, Port-Bouët) and the northern residential areas (e.g., Cocody, Yopougon, Abobo) necessitates robust infrastructure to bridge these distinct parts of the city.

Despite the construction of significant bridges, including the Henry-Konan-Bédié and the Félix-Houphouët-Boigny bridges, to facilitate this connectivity, the unique geography of the Ebrié Lagoon limits their effectiveness. This infrastructural inadequacy exacerbates transportation network issues, particularly affecting low and middle-income groups with limited public transport options and accessibility, thereby elevating transportation costs as a primary mobility barrier.

This study reveals that neighborhood type plays a crucial role in residents' engagement in recreational and social activities. Wealthier neighborhoods (Cocody) report higher participation rates, whereas individuals from precarious neighborhoods, particularly slums (Mossikro, Nouveau Quartier, or Gonzagueville), exhibit a notable propensity to forgo such activities. This disparity underscores the pressing need for urban policies aimed at enhancing recreational access in underprivileged areas to mitigate social exclusion.

Furthermore, the distance from workplaces emerges as a significant determinant of public transportation reliance and activity participation. Individuals living farther from their jobs, especially in vulnerable neighborhoods, face heightened risks of activity cancellation due to transportation challenges and increased costs. This relationship between residential location, transportation mode choice, and activity engagement points to the critical need for comprehensive urban planning that considers the mobility demands of all city residents.

The study's findings also highlight the exacerbated transport challenges faced by slum dwellers, ranging from fuel costs to public transportation scarcity. These insights into transport non-availability in marginalized areas add to the discourse on urban exclusion and advocate for targeted interventions to improve transportation equity and accessibility.

In sum, the Greater Abidjan Area's urban sprawl and its resultant mobility and accessibility challenges call for a concerted effort in urban planning and policy-making. Addressing these challenges requires an integrated approach that prioritizes equitable access to transportation

and recreational opportunities, thereby fostering a more inclusive urban environment for all residents.

6.2. Recommendations

To address the TRSE challenges identified in the Greater Abidjan Area, this thesis provides some detailed recommendations. These suggestions aim to improve urban mobility, enhance accessibility, and reduce the disparities affecting low-income and vulnerable groups within the city. Implementing these recommendations requires collaboration among government agencies, local communities, and international organizations to ensure effective and sustainable urban development.

6.2.1. Incorporate sustainable, innovative transportation solutions and infrastructure

Developing and expanding sustainable transportation options is essential for addressing TRSE in Abidjan. The implementation of mass transit systems, such as metro lines and Bus Rapid Transit (BRT) services, should be prioritized to alleviate traffic congestion and lower transportation costs. Moreover, integrating informal transportation modes with the formal public transportation system (SOTRA) can enhance accessibility and ensure that all commuters have access to transit options within one kilometer of their homes, as recommended by Morisset (2019) and reinforced by the insights of Sempéré and Linder (2023).

To mitigate TRSE, it is essential to expand and diversify public transportation options in Abidjan. This includes increasing the frequency of bus and light rail services, especially during peak hours, and expanding routes to underserved areas. Investments should focus on creating a more integrated public transportation system that efficiently connects residential areas with industrial zones, educational institutions, and healthcare facilities (Lucas, 2012; Delbosc and Currie, 2011). Improving transportation infrastructure, such as roads, bridges, and public transit facilities, is crucial for enhancing mobility. Priority should be given to completing the construction of essential bridges and developing alternative routes that circumvent the Ebrié Lagoon to reduce congestion and travel time (Kim et al., 2015). Regular maintenance of existing infrastructure ensures safety and reliability, essential for fostering public trust and encouraging the use of public transportation.

6.2.2. Promote smart urban renewal through transportation

Redeveloping public transportation corridors can catalyze smart urban renewal, contributing to the creation of efficient and inclusive cities. This approach recognizes the interrelation between land use, urban planning, and transportation, facilitating the development of public spaces that cater to the needs of all city residents, including vulnerable groups (Sempéré and Linder, 2023). Urban planning should prioritize mixed-use developments that minimize the distance between residential areas, workplaces, and essential services. Encouraging the development of affordable housing near employment centers and public transit hubs can reduce the reliance on long-distance commuting and enhance the quality of life for vulnerable populations (Watson, 2009).

6.2.3. Address vulnerability-specific transportation needs

Acknowledging and addressing gender differences in transportation use is crucial for creating an equitable transport system. Improving the safety and accessibility of public transportation, formulating gender-sensitive policies, and promoting community engagement can significantly reduce the gender gap in transportation use (Bande and Kaplan, 2023). This includes providing safe, well-lit paths for pedestrians and cyclists, and benefiting women and other vulnerable groups who rely on non-motorized transportation for daily activities. Encourage and support community-led transportation initiatives, such as carpooling networks or community bus services, to improve mobility in areas with limited public transportation options. Engaging local communities in identifying and implementing transportation solutions can foster a sense of ownership and ensure that interventions address the specific needs of residents (Lucas, 2012).

6.2.4. Integrate transportation policy with socio-economic strategies

A multifaceted approach that integrates transport policy with other sectors, including education, income redistribution, and urban planning, is necessary to effectively address social exclusion and poverty. This comprehensive strategy ensures that transportation facilitates socio-economic activities and is a key determinant of social inclusion (Ribeiro et al., 2021). Implement subsidy programs or introduce a tiered fare system to make public transportation more affordable for low-income residents. Such measures can significantly

lower the barrier to accessing job opportunities, education, and healthcare, contributing to social inclusion. Invest in developing parks, community centers, and recreational facilities in slum and low-income neighborhoods. Providing accessible and safe spaces for leisure and socializing can help reduce the social exclusion experienced by residents of these areas.

6.2.5. Periodical data collection and analysis

Continuous research and data collection are vital for understanding the evolving transportation needs of Abidjan's residents. To adapt and refine transportation policies effectively, local authorities should periodically conduct surveys and studies that include both qualitative and quantitative information. This approach allows for the identification of mobility imbalances and the development of targeted solutions to address the needs of disadvantaged groups, enhancing the overall efficiency and inclusivity of the transport system (Ribeiro et al., 2021). Studies should aim to capture detailed insights into the travel patterns, preferences, and barriers faced by different demographic groups, including women, the elderly, and people with disabilities. This data will inform targeted interventions and policy adjustments (Delbosc and Currie, 2011).

6.2.6. Ensure closeness of essential services and promote non-motorized transportation

Urban planning should prioritize the proximity of essential services, such as schools, hospitals, and markets, to residential areas. Integrating land-use planning with transportation planning can eliminate the need for long-distance travel and facilitate easier access to necessary services and opportunities, thereby promoting social cohesion and a sense of community within the city. Developing infrastructure for non-motorized transportation, such as safe, well-lit paths for pedestrians and cyclists, is vital for supporting sustainable urban mobility. This initiative not only benefits women and low-income households but also contributes to reducing air pollution, and traffic congestion, and improving public health (Ribeiro et al., 2021).

6.2.7. Promote public-private partnerships (PPPs)

Leverage PPPs to mobilize resources for transportation infrastructure development and service expansion. Collaborations between the government and private sector can introduce

innovative transportation solutions and enhance service efficiency (Bocarejo and Oviedo, 2012).

Implementing these recommendations requires a holistic approach that considers the complex interplay between transportation, urban development, and social equity. By implementing them, Abidjan can make significant strides toward creating a more inclusive, equitable, and sustainable transport system for all residents. Such efforts will not only reduce social exclusion but also foster greater economic opportunities and enhance the quality of life for all residents, positioning Abidjan as a model for progressive urban development in Sub-Saharan Africa.

6.3. The Research Contribution

This research delineates a comprehensive exploration of the intricate nexus between transportation access and social exclusion in the urban context of Abidjan, significantly enriching the discourse on urban mobility and its impact on societal dynamics. The findings illuminate the multifaceted nature of social exclusion, underpinned by a variety of determinants including income, gender, education, and geographic location. Such insights contribute profoundly to the broader understanding of the critical role transportation plays in either facilitating or hindering social inclusion within urban settings.

- **Deepened Understanding of Transportation's Impact on Social Inclusion and Exclusion:** The study elucidates how transportation serves as a pivotal factor influencing social inclusion and exclusion in Abidjan. By showcasing the critical intersections between mobility, access, and societal participation, this research foregrounds the transportation system's capacity to either bridge or exacerbate social divides. This contributes significantly to the academic and practical understanding of how transportation systems can be leveraged or reformed to foster greater social equity.
- **Framework for Multi-faceted Approaches to Mitigate Social Exclusion:** Drawing from the empirical evidence, this research advocates for a multi-dimensional approach to combat social exclusion, highlighting the importance of considering a spectrum of factors including income disparities, gender inequities, educational attainment, and geographic isolation. Such a comprehensive approach offers a nuanced framework for policymakers

and urban planners to develop targeted interventions aimed at enhancing accessibility and inclusivity in urban transportation systems.

- **Valuable Insights for Policymakers and Planning Practitioners:** By providing a detailed analysis of the realities of social exclusion and transportation challenges in Abidjan, the research furnishes valuable insights for transportation policymakers and urban planning practitioners. The findings underscore the necessity of crafting policies and planning practices that prioritize social inclusion, ensuring that urban mobility systems cater equitably to the diverse needs of all city residents, especially the most vulnerable populations.
- **Promotion of Equity and Inclusivity in Urban Transportation:** This study makes a compelling case for the promotion of social inclusion and equitable access to transportation in Abidjan and similar urban contexts. By addressing the systemic barriers that contribute to vulnerable populations' exclusion, the research underlines the potential of inclusive transportation policies to empower all citizens with access to essential resources and opportunities for professional development. This vision for improving equity and inclusivity in urban transportation aligns with global sustainable development goals, offering a roadmap for cities worldwide to mitigate social exclusion through more accessible and equitable transportation systems.

The contributions of this research extend beyond academic enrichment, providing a practical guide for addressing the complex challenges of urban mobility and social exclusion. By highlighting the interconnectedness of transportation access with broader societal inequities, this work lays a foundation for future initiatives aimed at creating more inclusive urban environments where transportation catalyzes social cohesion and equity.

6.4. Limits and Further Research

This research on TRSE in Abidjan offers valuable insights into the interplay between urban mobility and social equity. However, as with any study, it has limitations that open avenues for further research. Addressing these limitations can deepen our understanding of TRSE and contribute to more effective and inclusive urban transportation policies and practices. Below, we explore the key limitations and suggest directions for future research.

6.4.1. Limits of the current research

- **Geographic scope:** The focus on Abidjan, while providing in-depth local insights, limits the generalizability of the findings to other urban contexts, particularly those with different socio-economic dynamics and urban planning paradigms. Future studies could extend the geographic scope to include multiple cities across diverse economic and cultural landscapes, enabling a comparative analysis of TRSE in varying urban settings.
- **Cross-sectional design:** The cross-sectional nature of the study captures a snapshot of TRSE but does not allow for the observation of trends over time. Longitudinal studies could offer valuable insights into the evolving dynamics of urban mobility and social exclusion, especially in response to policy interventions and urban development changes.
- **Reliance on quantitative data:** While the quantitative data collected through surveys provides a robust empirical basis for the study, it may not fully capture the nuanced experiences and perceptions of individuals facing TRSE. Incorporating qualitative research methods, such as in-depth interviews and participatory action research, can enrich the understanding of the lived experiences of vulnerable populations and the complex socio-cultural factors influencing mobility and exclusion.
- **Limited consideration of informal transportation systems:** The study acknowledges the role of informal transportation modes in Abidjan but does not delve deeply into their operational dynamics, regulatory challenges, and potential for integration into the formal transportation system. Further research could specifically focus on the informal transportation sector, exploring strategies for leveraging these systems to enhance urban mobility and reduce social exclusion.

6.4.2. Avenues for further research

- **Longitudinal and comparative research:** Future inquiries should aim to implement longitudinal studies to track temporal shifts in transportation behaviors and the impact of specific urban and transportation policies on social exclusion. Such studies could offer valuable insights into the long-term efficacy of interventions aimed at mitigating TRSE. Moreover, comparative research across different urban contexts can elucidate universal and locale-specific drivers of social exclusion, informing targeted and adaptable policy interventions.

- Socioeconomic factors and infrastructure disparities: Subsequent research needs to delve into the nuances of affordability, service quality, and the infrastructural disparities across various neighborhoods in Abidjan. Understanding how these factors interplay to influence social exclusion and transport dynamics requires a multidimensional analysis that incorporates both quantitative and qualitative data.
- Qualitative studies on lived experiences: There's a critical need for qualitative research that explores the lived experiences of individuals, particularly those from vulnerable groups, navigating the challenges posed by TRSE in Abidjan. Through methods such as in-depth interviews, focus groups, and ethnographic studies, researchers can uncover the subjective dimensions of social exclusion, including perceptions of accessibility, safety, and the socio-cultural barriers to mobility. This approach will complement quantitative findings and provide a richer, more nuanced understanding of TRSE.
- Policy impact evaluation: Future research should also focus on evaluating the outcomes of transportation and urban development policies on reducing social exclusion. This involves not only assessing the direct impacts on mobility and access but also exploring the broader socio-economic outcomes for affected communities. Policy impact studies can help identify best practices and areas for improvement in urban planning and transportation policy.
- Vulnerability and intersectionality: Exploring the intersectionality of vulnerability concerning TRSE presents an avenue for further investigation. This entails examining how factors such as age, gender, disability, and economic status intersect to compound experiences of social exclusion. By adopting an intersectional lens, future studies can propose more inclusive and equitable transportation solutions that address the needs of the most marginalized populations.

By addressing these limitations and exploring the suggested avenues for further research, future studies can build on the foundational work laid out in this research. In doing so, they will contribute to a more comprehensive understanding of TRSE, ultimately guiding the development of more inclusive and equitable urban transportation systems in Abidjan and beyond.



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APPENDIXES

APPENDIX-1. Cancellation rate of OOH activities

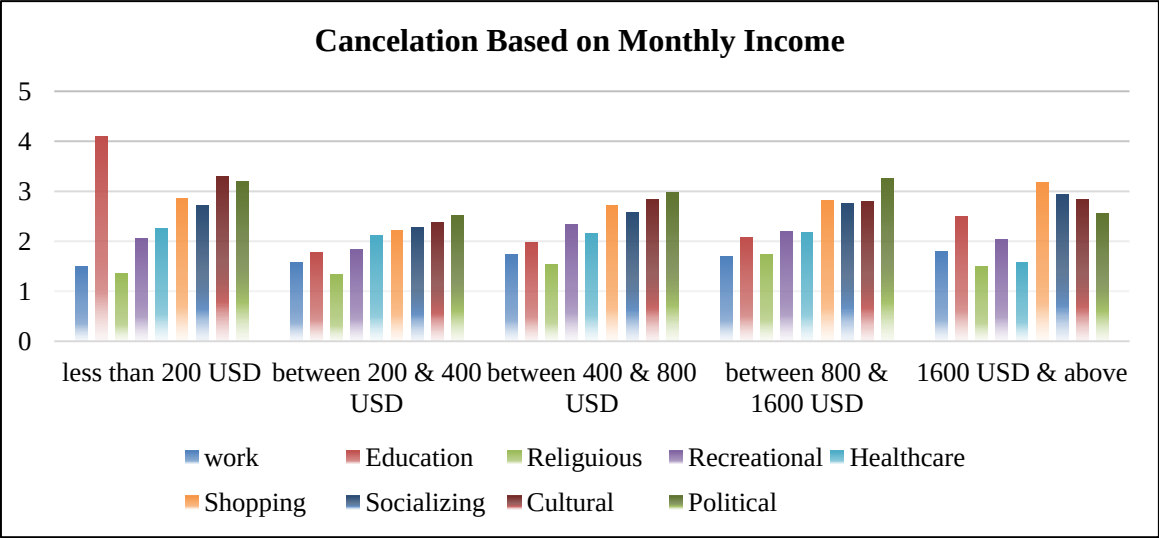


Figure 1. Cancellation rate of OOH activities based on monthly income

APPENDIX-2. Cancellation rate of OOH activities based on monthly income

Table 1. Mean scores and standard deviations of activity cancellations

Issue		N	Mean	Std. Deviation	P-value
Job/income	less than 200 USD	89	2.0899	1.18360	0.236
	between 200 and 400 USD	95	2.4947	1.26216	
	between 400 and 800 USD	56	2.3571	1.25667	
	between 800 and 1600 USD	37	2.2973	1.05053	
	1600 USD and above	28	2.2143	.99469	
Education	less than 200 USD	18	2.5556	1.09664	0.978
	between 200 and 400 USD	12	2.6667	1.55700	
	between 400 and 800 USD	52	2.4615	1.27512	
	between 800 and 1600 USD	30	2.5667	1.25075	
	1600 USD and above	4	2.7500	.50000	
Religious	less than 200 USD	102	1.9118	1.25156	0.198
	between 200 and 400 USD	91	2.1209	1.29816	
	between 400 and 800 USD	88	2.2841	1.40564	
	between 800 and 1600 USD	55	2.3636	1.48279	
	1600 USD and above	29	1.9655	1.17967	
Recreational/sport	less than 200 USD	79	2.4810	1.11930	0.577
	between 200 and 400 USD	95	2.5263	1.14708	
	between 400 and 800 USD	83	2.5783	1.35359	
	between 800 and 1600 USD	55	2.3636	1.23773	
	1600 USD and above	27	2.1852	.83376	
Healthcare	less than 200 USD	99	2.2323	1.21074	0.095
	between 200 and 400 USD	95	2.4842	1.14727	
	between 400 and 800 USD	91	2.6703	1.27414	
	between 800 and 1600 USD	55	2.5273	1.25984	
	1600 USD and above	31	2.1613	1.36862	
Shopping	less than 200 USD	98	2.7245	.95010	0.050
	between 200 and 400 USD	94	2.5213	1.08488	
	between 400 and 800 USD	88	2.8295	1.22448	
	between 800 and 1600 USD	55	2.9818	1.09698	
	1600 USD and above	31	3.0968	1.445790	
Socializing	less than 200 USD	90	3.1000	1.28124	0.001
	between 200 and 400 USD	85	2.4588	1.08620	
	between 400 and 800 USD	79	2.9114	1.27289	
	between 800 and 1600 USD	53	2.5660	1.20111	
	1600 USD and above	31	3.2581	1.41345	

APPENDIX-3. Cancellation of OOH activities according to monthly income

Table 2. Activity cancellations according to monthly income

<i>TYPE</i>	<i>Monthly income</i>	<i>Always</i>	<i>Frequently</i>	<i>Rarely</i>	<i>Sometimes</i>	<i>Never</i>	<i>not declared</i>
<i>Work</i>	less than 200 USD	1		41		48	22
	between 200 and 400 USD		1	42	2	41	14
	between 400 and 800 USD	1	1	24	5	25	40
	between 800 and 1600 USD		1	19	2	15	22
	1600 USD and above		2	14	2	12	5
<i>Education</i>	less than 200 USD	7		2	2		101
	between 200 and 400 USD			7		2	91
	between 400 and 800 USD	2	2	20	8	19	45
	between 800 and 1600 USD	1	2	13	4	9	30
	1600 USD and above	1			1	2	31
<i>Religious</i>	less than 200 USD			28	4	70	10
	between 200 and 400 USD		1	28		66	5
	between 400 and 800 USD		3	26	7	54	6
	between 800 and 1600 USD	1	2	23	5	27	1
	1600 USD and above			15		15	5
<i>Recreational</i>	less than 200 USD	7	3	30	11	33	28
	between 200 and 400 USD	4		49	6	33	8
	between 400 and 800 USD	12	4	32	12	27	9
	between 800 and 1600 USD	3	7	19	7	19	4
	1600 USD and above			16	7	6	6
<i>Healthcare</i>	less than 200 USD	7	11	48	10	27	9
	between 200 and 400 USD	3	4	74	4	10	5
	between 400 and 800 USD	6	7	45	6	24	8
	between 800 and 1600 USD	3	3	30	8	13	2
	1600 USD and above		2	9	2	20	2
<i>Shopping</i>	less than 200 USD	7	20	43	27	3	12
	between 200 and 400 USD	3	3	69	12	7	6
	between 400 and 800 USD	9	11	41	19	6	10
	between 800 and 1600 USD	3	13	21	16	4	2
	1600 USD and above	4	8	9	7	1	6
<i>Socializing</i>	less than 200 USD	7	20	52	18	5	10
	between 200 and 400 USD	5	3	60	12	8	12
	between 400 and 800 USD	4	12	36	19	9	16
	between 800 and 1600 USD	6	6	24	16	4	3
	1600 USD and above	4	6	12	9	2	2
<i>Cultural events</i>	less than 200 USD	11	29	26	21	3	19
	between 200 and 400 USD	4	3	60	19	3	11
	between 400 and 800 USD	10	8	33	23	4	18
	between 800 and 1600 USD	5	5	20	19	3	7
	1600 USD and above	4	6	11	6	4	4
<i>Political events</i>	less than 200 USD	12	15	18	25	3	39
	between 200 and 400 USD	3	5	30	14	4	44
	between 400 and 800 USD	8	12	18	16	6	36
	between 800 and 1600 USD	8	5	14	16		15
	1600 USD and above	4	4	8	7	9	3

APPENDIX-4. Correlation vehicle ownership and access to OOH activities

Table 3. Issue of access to OOH activities based on vehicle ownership

Activities	Owned Vehicle	No Vehicle	p-value
Work			
Daily	66	167	
Alternate day	6	25	
Twice weekly	9	26	0.104
Weekly	3	19	
Twice a month	0	7	
Monthly	1	7	
Occasionally	0	12	
Education			
Daily	20	42	
Alternate day	5	7	
Twice weekly	6	4	0.140
Weekly	1	0	
Twice a month	0	2	
Monthly	1	1	
Occasionally	1	10	
Religious			
Daily	17	84	0.000
Alternate day	10	23	
Twice weekly	19	67	
Weekly	36	44	
Twice a month	4	9	
Monthly	7	15	
Occasionally	4	44	
Recreational			
Daily	5	11	0.000
Alternate day	10	8	
Twice weekly	15	39	
Weekly	28	73	
Twice a month	11	18	
Monthly	8	15	
Occasionally	11	93	
Healthcare			
Daily	0	1	
Alternate day	12	0	
Twice weekly	18	3	0.000
Weekly	13	7	
Twice a month	9	44	
Monthly	24	107	
Occasionally	20	113	
Shopping			
Daily	2	1	
Alternate day	10	3	0.000
Twice weekly	14	8	
Weekly	14	17	
Twice a month	14	19	
Monthly	20	73	
Occasionally	17	149	

APPENDIX-4. (continued) Correlation vehicle ownership and access to OOH activities

Table 3. (continued) Issue of access to OOH activities based on vehicle ownership

Activities	Owned Vehicle	No Vehicle	p-value
Socializing			
Daily	2	3	
Alternate day	10	4	
Twice weekly	8	9	
Weekly	8	14	0.000
Twice a month	25	48	
Monthly	24	52	
Occasionally	15	123	
Cultural events			
Daily	0	1	
Alternate day	9	2	
Twice weekly	9	2	
Weekly	9	8	0.000
Twice a month	27	31	
Monthly	16	44	
Occasionally	19	163	
Political events			
Daily	1	2	
Alternate day	6	0	
Twice weekly	13	0	
Weekly	8	3	0.000
Twice a month	16	13	
Monthly	14	19	
Occasionally	21	148	

APPENDIX-5. Issues attending OOH activities based on vehicle ownership

Table 4. Mean scores and standard deviations based on vehicle ownership

Issues	Vehicle ownership	N	Mean	Std. Deviation	P values
Job/income	Vehicle	71	2.2958	1.10058	0.962
	No Vehicle	234	2.3034	1.22467	
Education	Vehicle	36	2.5556	1.20581	0.903
	No Vehicle	80	2.5250	1.26266	
Religious	Vehicle	92	2.2174	1.38140	0.449
	No Vehicle	273	2.0952	1.32221	
Recreational/sport	Vehicle	87	2.2759	1.11741	0.070
	No Vehicle	252	2.5437	1.20510	
Healthcare	Vehicle	93	2.5054	1.31566	0.570
	No Vehicle	278	2.4209	1.21328	
Shopping	Vehicle	93	2.9892	1.21131	0.029
	No Vehicle	273	2.6923	1.09503	
Socializing	Vehicle	91	2.8022	1.32682	0.837
	No Vehicle	247	2.8340	1.23663	

APPENDIX-6. Access to OOH activity participation

Table 5. Frequency in OOH activities based on gender

Activities	Male	Female	p-value
Work			
Daily	142	91	
Alternate day	21	10	
Twice weekly	21	14	0.365
Weekly	15	7	
Twice a month	2	5	
Monthly	3	5	
Occasionally	6	6	
Education			
Daily	38	24	
Alternate day	9	3	
Twice weekly	6	4	
Weekly	1	0	
Twice a month	0	2	0.192
Monthly	0	2	
Occasionally	5	6	
Religious			
Daily	101	0	
Alternate day	29	4	
Twice weekly	51	35	0.000
Weekly	45	35	
Twice a month	2	11	
Monthly	0	22	
Occasionally	2	46	
Recreational			
Daily	15	1	
Alternate day	14	4	
Twice weekly	44	10	0.000
Weekly	64	37	
Twice a month	17	12	
Monthly	12	11	
Occasionally	46	58	
Healthcare			
Daily	1	0	
Alternate day	3	9	
Tice weekly	12	9	
Weekly	13	7	0.020
Twice a month	23	30	
Monthly	87	44	
Occasionally	76	57	
Shopping			
Daily	3	0	
Alternate day	6	7	
Twice weekly	12	10	0.305
Weekly	16	15	
Twice a month	22	11	
Monthly	61	32	
Occasionally	92	74	

APPENDIX-6. (continued) Access to OOH activity participation

Table 5. (continued) Frequency in OOH activities based on gender

Activities	Male	Female	p-value
Socializing			
Daily	5	0	
Alternate day	10	4	
Twice weekly	13	4	
Weekly	12	10	0.044
Twice a month	48	25	
Monthly	36	40	
Occasionally	76	62	
Cultural events			
Daily	1	0	
Alternate day	7	4	
Twice weekly	9	2	
Weekly	8	9	0.175
Twice a month	29	29	
Monthly	40	20	
Occasionally	101	81	
Political events			
Daily	3	0	
Alternate day	3	3	
Twice weekly	9	4	
Weekly	9	2	0.087
Twice a month	21	8	
Monthly	20	13	
Occasionally	87	82	

APPENDIX-7. Activity participation based on type of inhabited neighbourhood

Table 6. Frequency in OOH activities based on neighbourhoods

Variables	Type of inhabited neighbourhood					p-value
	Slums	Poor	Mixed	Residential	well-off	
Recreational						0.000
Daily	0	3	9	4	0	
Alternate day	1	5	9	2	1	
Twice weekly	4	12	28	9	0	
Weekly	17	16	42	23	2	
Twice a month	10	5	8	6	0	
Monthly	7	3	10	3	0	
Occasionally	40	14	48	0	2	
Socializing						
Daily	1	0	2	2	0	0.000
Alternate day	2	3	5	4	0	
Twice weekly	2	2	9	3	1	
Weekly	2	5	9	6	0	
Twice a month	5	14	41	12	1	
Monthly	12	13	25	24	2	
Occasionally	41	25	64	6	1	
Occasionally	40	29	83	17	0	

APPENDIX-8. Means of transport based on education level

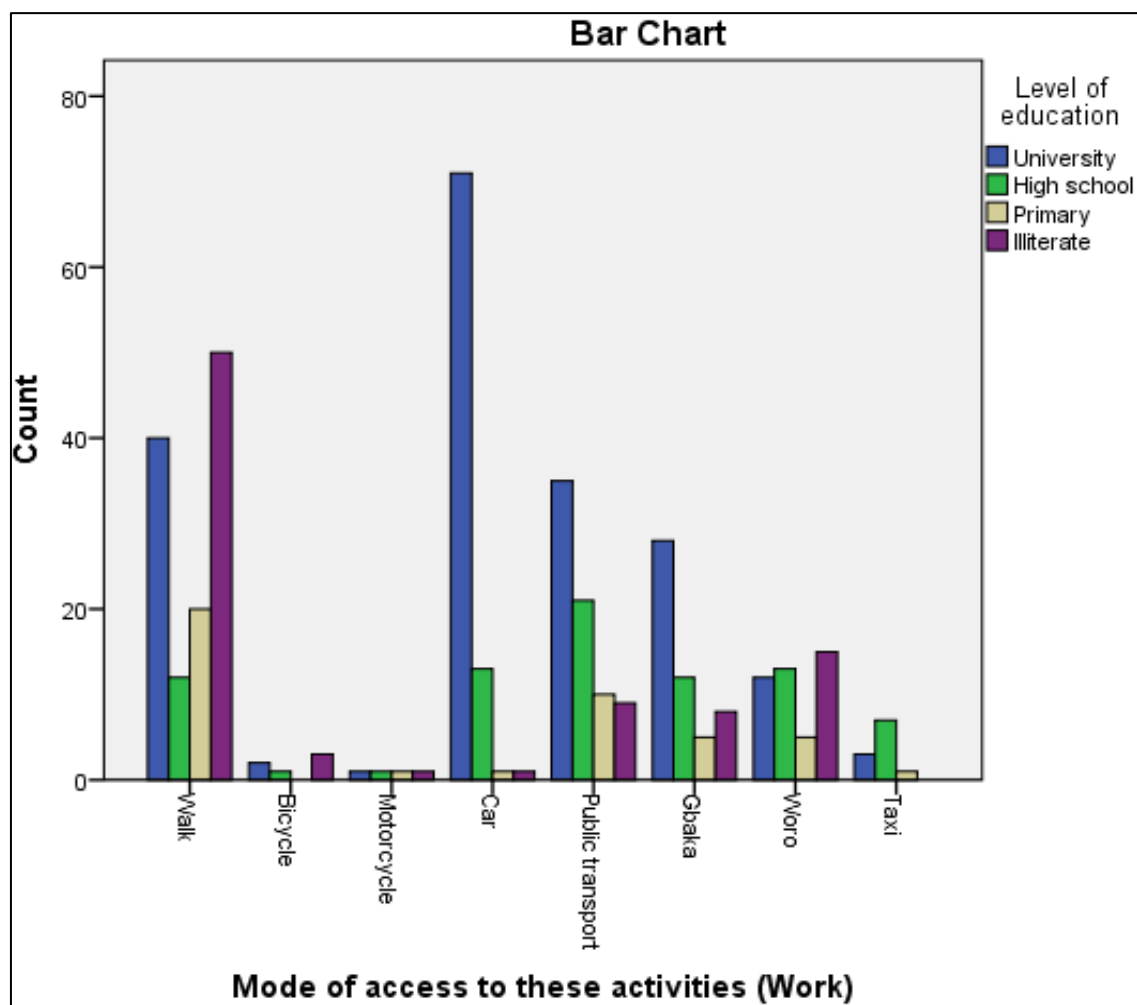


Figure 2. Bar chart - mode of access based on education level

APPENDIX-9. Mode of access based on type of inhabited neighbourhood

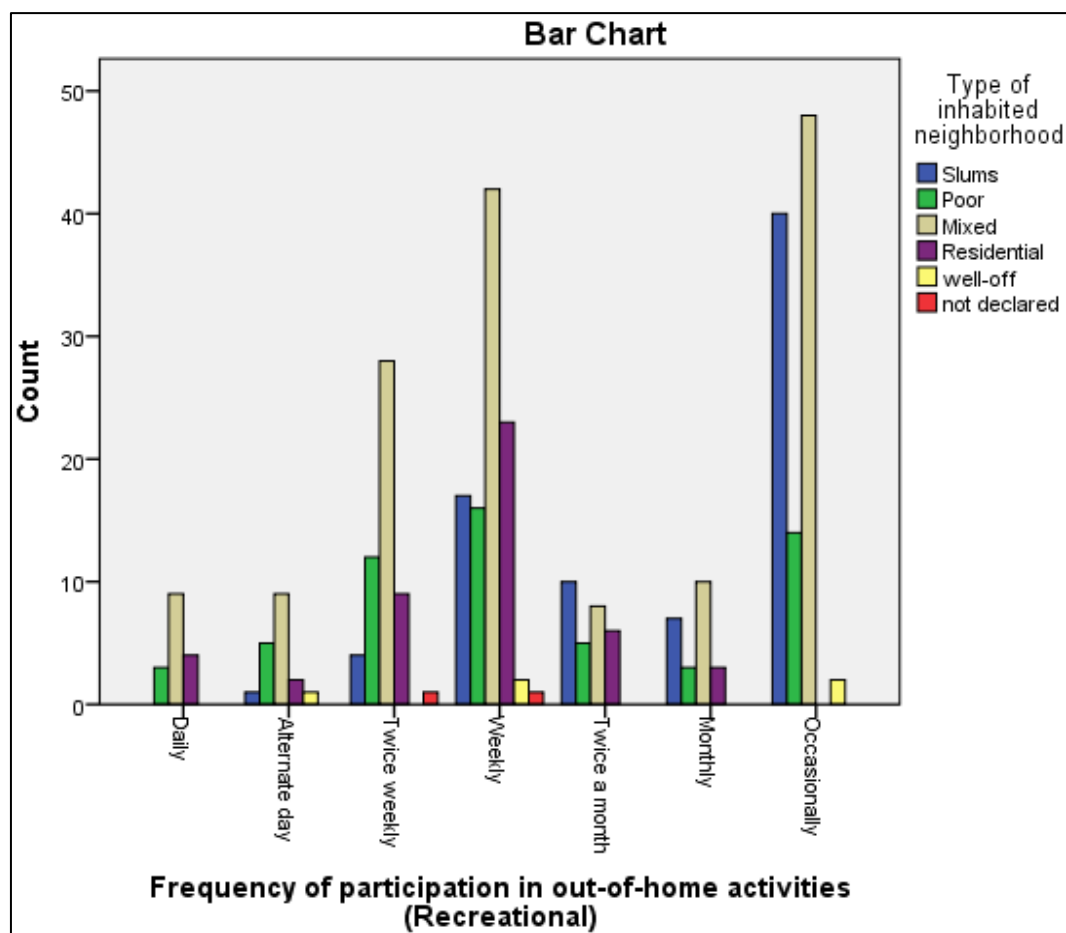


Figure 3. Bar chart - Frequency of “Work” participation based on type of inhabited neighbourhood

APPENDIX-10. Mode of participation based on type of inhabited neighbourhood

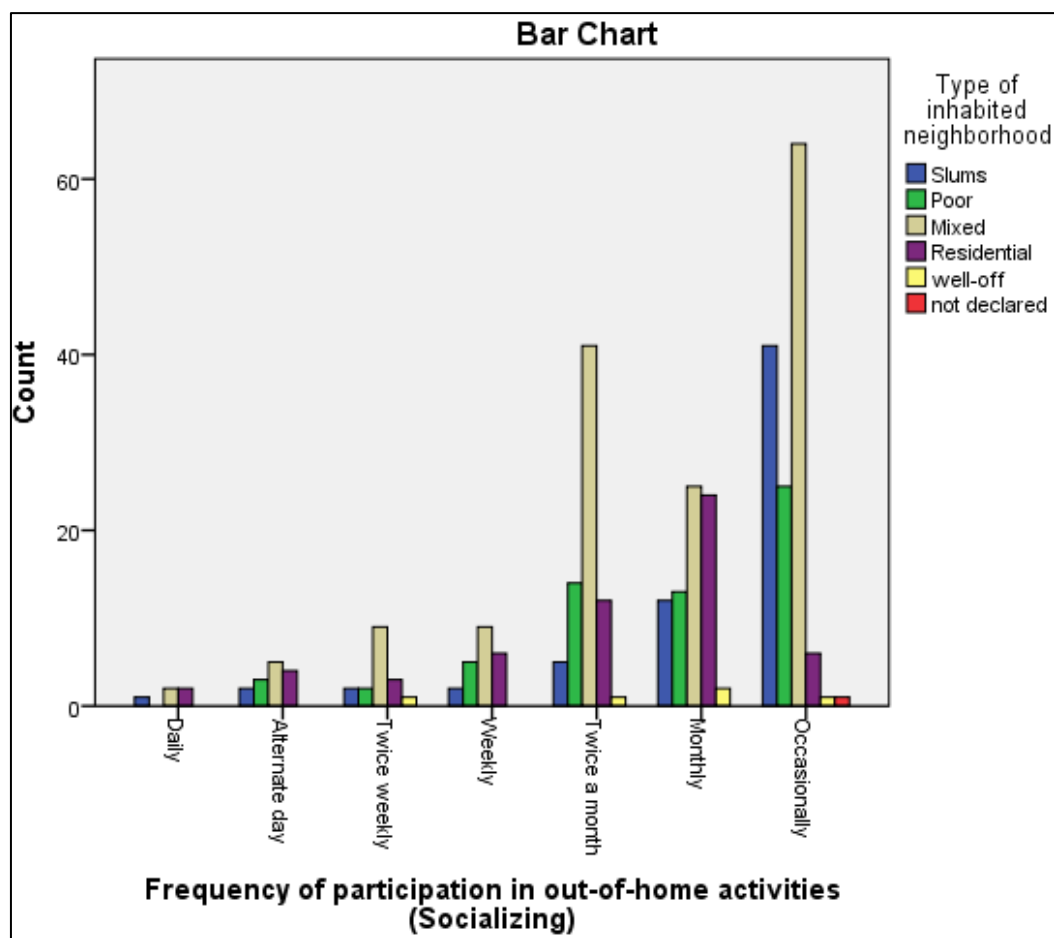


Figure 4. Bar chart - Frequency of “Socializing” participation based on type of inhabited neighbourhood

APPENDIX-11. Access to activities based on type of neighbourhood

Table 7. Mean scores and standard deviations based on type of neighbourhood

Issues		N	Mean	Std. Deviation	p-value
Recreational/sport	Slums	79	2.8987	1.24648	.006
	Poor	58	2.3621	1.07112	
	Mixed	148	2.3716	1.15045	
	Residential	46	2.2174	1.17214	
	well-off	6	2.1667	1.16905	
Socializing	Slums	67	3.0746	1.29467	.152
	Poor	58	2.5000	1.08012	
	Mixed	151	2.8477	1.31529	
	Residential	54	2.8704	1.16629	
	well-off	6	2.6667	1.50555	

APPENDIX-12. Activities cancelation rate based on education level

Table 8. Mean scores and standard deviations based on activities and education level

Miss activities		N	Mean	Std. Deviation	p-values
Job/income	University	176	2.2955	1.14801	0.040
	High school	24	2.5833	1.47196	
	Primary	36	2.6667	1.54919	
	Illiterate	69	2.0290	.92309	
	Total	305	2.3016	1.19518	
Education	University	21	2.5714	1.36277	0.036
	High school	72	2.5972	1.27445	
	Primary	13	2.9231	.75955	
	Illiterate	10	1.5000	.70711	
	Total	116	2.5345	1.24013	
Religious	University	171	2.0994	1.30904	0.000
	High school	73	2.4521	1.49109	
	Primary	39	2.6410	1.44162	
	Illiterate	82	1.6463	1.01071	
	Total	365	2.1260	1.33651	
Recreational/sport	University	161	2.3602	1.08716	0.357
	High school	73	2.6438	1.42760	
	Primary	29	2.5172	1.52645	
	Illiterate	76	2.5395	.97216	
	Total	339	2.4749	1.18738	
Healthcare	University	177	2.3164	1.16356	0.016
	High school	76	2.7632	1.41297	
	Primary	37	2.7297	1.57495	
	Illiterate	81	2.2840	.96481	
	Total	371	2.4420	1.23846	
Shopping	University	175	2.7771	1.11497	0.008
	High school	72	3.0833	1.18381	
	Primary	36	2.3333	1.17108	
	Illiterate	83	2.6627	1.03920	
	Total	366	2.7678	1.13144	
Socializing	University	163	2.6994	1.21785	0.006
	High school	66	3.0000	1.33589	
	Primary	32	3.4688	1.48072	
	Illiterate	77	2.6753	1.09354	
	Total	338	2.8254	1.25962	

APPENDIX-13. Activities cancelation based on education level

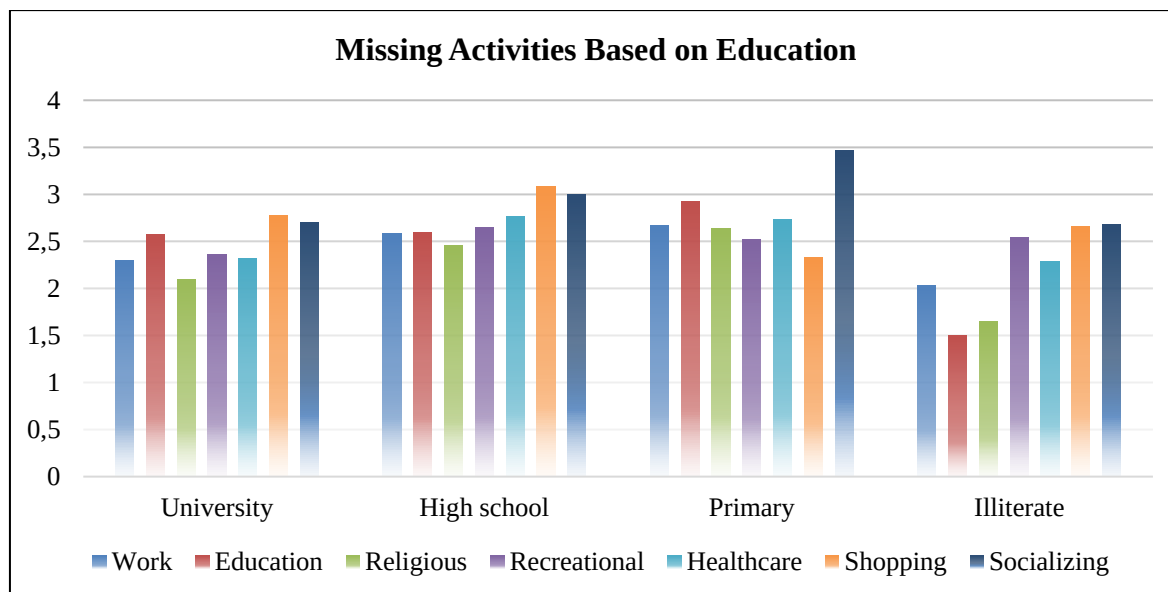


Figure 5. Line Chart for Frequency of activities cancelation based on education level

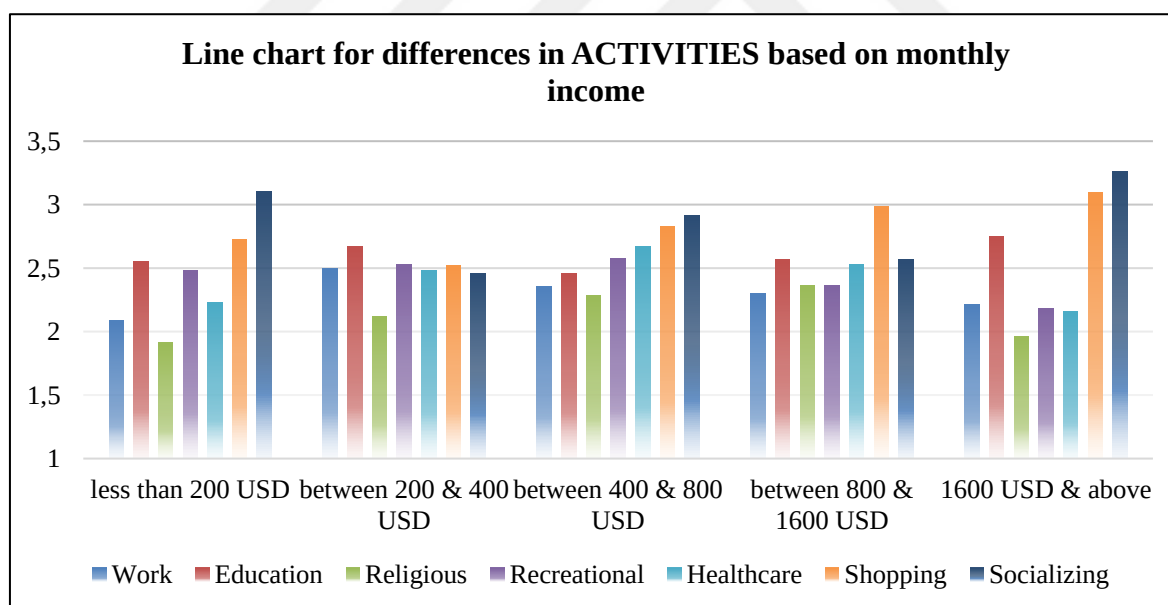


Figure 6. Line Chart for Frequency of OOH activities based on monthly income

APPENDIX-14. Activities cancelation rate based on vehicle ownership

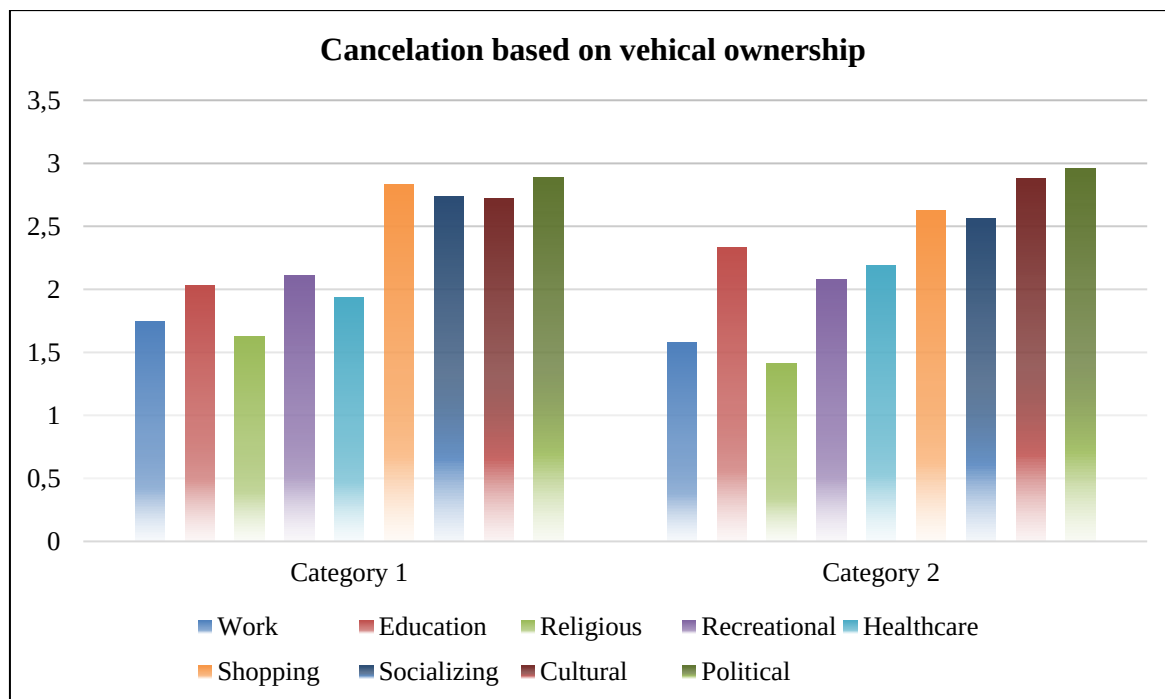


Figure 7. Activities cancelation rate based on vehicle ownership

APPENDIX-15. Survey Questionnaire

SURVEY QUESTIONNAIRE

Research student: Bassirou BANDE, PhD candidate Gazi University, Ankara/Turkey

Supervisor: Prof. Dr. Hülügü KAPLAN, Gazi University/Faculty of Architecture

Dept. of City and Regional Planning

Research Objective:

This study aims to explore transport issues and their role in daily mobility and activity participation in selected case study sites of Abidjan District. It uses the qualitative methodology of questionnaire surveys with adult respondents.

NB:

Participation in the survey is totally voluntary and you can stop answering at any time during the survey. Your identity information will not be shared; the data will be used only for educational purposes.

1.Name of respondent	2. Residential Address	3. Age	4. Household Size

5.Gender		6.Current marital status		
1. Male	2. Female	a. Single	b. Married	c. Other

7. What is your level of education?			
1. University	2. High school	3. Primary	4. Illiterate

8. How much is your monthly income?				
1. Less than 200	2. Between 200-400	3. Between 400-800	4. Between 800-1600	5. 1600 and above

APPENDIX-15. (continued) Survey Questionnaire

9. Do you own any house or vehicles in your household?				
1. Multiple vehicles (MV)	2. One vehicle (1V)	3. Zero vehicle - Owner housing (0VO)	4. Zero vehicle - Renting housing (0VR)	N.A

10. Do you belong to one of the following vulnerable groups of people?						
Categories of people in vulnerable situations	N.A.	Elderly	Disable	Women	Poor	Children

11. What kind of neighbourhood do you live in? Do you live in a precarious neighbourhood? Wealthy neighbourhood? Which on a scale of 1 (the most precarious) to 5 (the wealthiest)?					
Type of inhabited neighbourhood	Slums	Poor neighbourh ood	Mixed neighbourhood	Residential neighbourhood	Well-off neighbourhood
	1	2	3	4	5
Appreciation					

12. How far is your neighbourhood from your place of work? Rate on a scale of 1 (closest) to 5 (farthest).						
Distance from the inhabited neighbourhood	N.A.	[0-500m[	[500m- 1500m[	[1500m- 5km[	[5km- 15km[	[15km- 35km[
		1	2	3	4	5
Appreciation						

APPENDIX-15. (continued) Survey Questionnaire

15) How would you rank the following aspects of public transport service from 1 (lowest issue) to 5 (highest issue)					
Issues of public transport	1	2	3	4	5
151. Distance to stop from residence					
152. Cost of travel					
153. Indirect access to destination					
154. Availability at night					
155. Availability of seat					
156. Waiting time in transport					
157. Waiting time at stop					
158. Discomfort during travel					

16) Do you think that those issues of transport or accessibility reduce your access to the following? (From 1 (lowest issue) to 5 (highest issue))					
Issues of transport or accessibility reducing your access	1	2	3	4	5
161. Job or income					
162. Education					
163. Healthcare					
164. Shopping					
165. Sports /recreational					
166. Social activities					
167. Political events					

APPENDIX-15. (continued) Survey Questionnaire

17) What are the reasons of missing or cancelling travel? (From 1 (lowest issue) to 5 (highest issue))					
Reasons/Level of missing or cancelling travel	1	2	3	4	5
171. Cost of travel / fuel					
172. Fuel / CNG shortage					
173. Non availability of personal transport					
174. Non availability of public transport					
175. Quality of public transport					
176. Non availability of escort or permission from house					
177. Political situation like strikes,					
178. Other issues					

18) Have you ever missed or cancelled any of these activities due to travel issues in past two months? If so, how often? (Tick the appropriate box)						
Activities	N.A	Very often	Often	Sometimes	Rarely	Never
181. Work						
182. Education						
183. Religious						
184. Recreational						
185. Healthcare						
186. Shopping						
187. Socializing						
188. Cultural events						
189. Political events						

APPENDIX-16. Interview Questions

INTERVIEW QUESTIONS AND EXPECTED INSIGHTS

Research student: Bassirou BANDE, PhD candidate Gazi University, Ankara/Turkey

Supervisor: Prof. Dr. Hülügü KAPLAN, Gazi University/Faculty of Architecture

Dept. of City and Regional Planning

Research Objective: This study aims to explore transport issues and their role in daily mobility and activity participation in selected case study sites of Abidjan District. It uses the qualitative methodology of interviews with adult respondents.

NB: Participation in the interview is voluntary and you can stop answering at any time during the survey. Your identity information will not be shared; the data will be used only for educational purposes.

Daily Commute Experience

Question: Can you describe your daily commute using public transport in Abidjan? Include details about the modes of transport you use, the duration of your commute, and the frequency of your trips.

Expected Insight: Understand the logistical aspects of their commute, including reliability issues, overcrowding, and the physical condition of transportation facilities.

Accessibility and Affordability

Question: How accessible and affordable is public transport for you? Are there any financial challenges you face in using public transportation regularly?

Expected Insight: Gauge the economic impact of commuting on individuals, highlighting any disparities in access due to cost or physical location.

Safety and Security Concerns

Question: Have you encountered any safety or security issues while using public transport? How do these concerns affect your daily life and mobility?

Expected Insight: Explore issues related to personal safety, theft, harassment, or accidents, underscoring the social implications of inadequate transport safety measures.

Impact on Employment and Opportunities

Question: Has your experience with public transport affected your employment opportunities or job choices? Are there any opportunities you feel you've missed out on due to transportation challenges?

APPENDIX-16. (continued) Interview Questions

Expected Insight: Identify how transport accessibility influences economic participation and social mobility, potentially leading to job exclusion or limited access to opportunities.

Family and Social Life

Question: How does your reliance on public transport affect your family and social life? For instance, are you able to attend family events or social gatherings as you would like?

Expected Insight: Highlight the broader social implications of transport challenges, including reduced social interaction and community participation.

Health and Well-being

Question: Has your health or well-being been impacted by your daily use of public transport? Consider aspects like stress, physical exhaustion, or exposure to pollution.

Expected Insight: Assess the physical and psychological effects of commuting stress, overcrowding, and environmental factors on individuals.

Perceived Solutions and Recommendations

Question: From your perspective, what improvements or solutions would most significantly enhance your public transport experience and reduce social exclusion?

Expected Insight: Capture the commuter's view on potential improvements, whether in service quality, safety measures, affordability, or infrastructure enhancements.

APPENDIX-17. Interview Answers

ANSWERS

Interviewee 1

Daily Commute Experience

Question: Can you describe your daily commute using public transport in Abidjan?

Answer: My daily commute involves taking a combination of a gbaka (minibus) and a woro-woro (shared taxi). The journey starts with a 10-minute walk to the gbaka stop, followed by a 30-minute ride to the central business district. From there, I switch to a woro-woro to reach my office, which takes another 20 minutes. Overall, my commute can take up to an hour or more, depending on traffic. The buses and taxis are often crowded, especially during peak hours, making the trip uncomfortable on many days.

Accessibility and Affordability

Question: How accessible and affordable is public transport for you?

Answer: Public transport is relatively affordable, which is crucial for me as I have to manage my expenses carefully. However, fare increases have been a challenge, especially during periods of economic downturn. Accessibility varies; while I can usually find a gbaka or woro-woro for my commute, the reliability of these services can be a concern. There are days when delays or overcrowded vehicles significantly disrupt my schedule.

Safety and Security Concerns

Question: Have you encountered any safety or security issues while using public transport?

Answer: As a woman yes, safety on public transport is a constant worry. The vehicles are often not well-maintained, leading to breakdowns or accidents. Overcrowding can also make pickpocketing easier. I've heard stories of personal belongings being stolen, especially in packed buses. There have been a few instances where I felt unsafe due to aggressive behaviour or disputes among passengers.

Impact on Employment and Opportunities

Question: Has your experience with public transport affected your employment opportunities or job choices?

APPENDIX-17. (continued) Interview Answers

Answer: Absolutely. I've had to turn down job offers that were too far from the main public transport routes because the commute would be impractical. The unreliability of transport also means I have to leave home much earlier to avoid being late, limiting my options for extra work or evening classes.

Family and Social Life

Question: How does your reliance on public transport affect your family and social life?

Answer: It significantly impacts my ability to participate in family and social activities. The time spent commuting means less time at home with my family or attending social gatherings. Last-minute transport issues have made me miss important family events, which is disheartening.

Health and Well-being

Question: Has your health or well-being been impacted by your daily use of public transport?

Answer: Yes, the stress and physical exhaustion from daily commuting take a toll on my health. The overcrowded conditions, combined with the stress of navigating delays or disruptions, contribute to my overall fatigue. Exposure to pollution, especially during traffic jams, is also a concern for my respiratory health.

Perceived Solutions and Improvements

Question: From your perspective, what improvements or solutions would most significantly enhance your public transport experience and reduce social exclusion?

Answer: Improving the reliability and frequency of public transport would make a huge difference. Investments in better infrastructure, like dedicated bus lanes to reduce traffic delays, and modernizing the fleet for safety and comfort are critical. Additionally, implementing a more integrated transport system with real-time updates would help in planning commutes more effectively, making the city more accessible for everyone.

Interviewee 2

Daily Commute Experience

Question: Can you describe your daily commute using public transport in Abidjan?

APPENDIX-17. (continued) Interview Answers

Answer: My daily commute is a bit unconventional compared to others. I primarily rely on the SOTRA bus service due to its relative reliability and coverage of major routes. My journey involves a 15-minute walk to the nearest SOTRA bus station, followed by a 45-minute bus ride to reach my workplace. The buses are generally in decent condition, but they can get crowded during rush hours. I appreciate the fixed routes and schedules, which provide some predictability, though unexpected delays do occur.

Accessibility and Affordability

Question: How accessible and affordable is public transport for you?

Answer: For me, generally transport is quite inaccessible in Abidjan, but public transport remains the most affordable option. The fixed rate for SOTRA buses is manageable within my budget, helping me save on transportation costs. However, the challenge lies in the last-mile connectivity from the bus stop to my workplace, which sometimes necessitates an additional expense for a taxi.

Safety and Security Concerns

Question: Have you encountered any safety or security issues while using public transport?

Answer: I've generally felt safe on SOTRA buses, thanks to their regulated service. However, during late hours, waiting at bus stops can feel unsafe due to poor lighting and less frequent patrols. I've been fortunate to avoid personal security incidents, but the anxiety around potential risks is always present, especially when the buses are overcrowded.

Impact on Employment and Opportunities

Question: Has your experience with public transport affected your employment opportunities or job choices?

Answer: Surprisingly, it has had a positive effect. The efficiency of SOTRA buses compared to other forms of public transport has allowed me to consider job opportunities slightly further from my home. However, the limitation to areas served by this network means I'm still constrained to a specific radius within Abidjan for work opportunities.

Family and Social Life

Question: How does your reliance on public transport affect your family and social life?

APPENDIX-17. (continued) Interview Answers

Answer: It does impose certain restrictions. I have to plan my social engagements around the bus schedule, which often means declining invitations to events that end late, as bus services become less frequent. It's a trade-off between enjoying the evening out and ensuring I have a safe and reliable way to get home.

Health and Well-being

Question: Has your health or well-being been impacted by your daily use of public transport?

Answer: The stress associated with ensuring I catch the bus on time does add to my daily stress levels. However, the walks to and from bus stops have inadvertently become a form of exercise, which has had a positive impact on my physical health. The main concern remains the air quality on congested roads, which can exacerbate respiratory issues.

Perceived Solutions and Improvements

Question: From your perspective, what improvements or solutions would most significantly enhance your public transport experience and reduce social exclusion?

Answer: Enhancing the frequency of buses during peak hours and extending service hours into the late evening would significantly improve the experience. Additionally, improving the safety around bus stops, such as better lighting and security presence, would address safety concerns. Finally, expanding the bus network to cover more areas and integrating it with other forms of public transport, like minibuses and water taxis, through a unified payment system could make the entire city more accessible.

Interviewee 3

Daily Commute Experience

Question: Can you describe your daily commute using public transport in Abidjan?

Answer: Unlike many others, I primarily rely on water taxis (pinasses) for my daily commute due to my residence's proximity to the lagoon. This choice significantly reduces my exposure to road traffic congestion. My commute involves a 5-minute walk to the nearest dock, followed by a 20-minute water taxi ride. While this mode of transport is less common, it offers a serene and relatively predictable commuting experience, though availability can be limited, especially outside standard commuting hours.

APPENDIX-17. (continued) Interview Answers

Accessibility and Affordability

Question: How accessible and affordable is public transport for you?

Answer: Water taxis are conveniently accessible from my home and are reasonably priced, making them an attractive option. However, their routes are limited, and service frequency can vary, which means I sometimes have to use a combination of water and road transport, increasing the overall cost and complexity of my commute.

Safety and Security Concerns

Question: Have you encountered any safety or security issues while using public transport?

Answer: While on the water taxis, I've generally felt safe, as operators tend to be cautious and the rides peaceful. However, transitioning from water to road transport at docks can be chaotic and feel less secure, particularly in the evenings. The main safety concerns on the water are related to occasional overcrowding and the adequacy of safety equipment on board.

Impact on Employment and Opportunities

Question: Has your experience with public transport affected your employment opportunities or job choices?

Answer: Yes, my reliance on a less conventional commuting method has influenced my job choices, steering me towards opportunities that either align with the water taxi routes or are flexible in terms of working hours and location. This limitation has made me pass on certain opportunities that were not logistically feasible.

Family and Social Life

Question: How does your reliance on public transport affect your family and social life?

Answer: The unique nature of my commute has actually become a topic of interest among friends and family. It has limited late evening social activities due to the reduced frequency of water taxis after dark, but it also encourages more gatherings in waterfront areas, which are easily accessible for me.

Health and Well-being

Question: Has your health or well-being been impacted by your daily use of public transport?

APPENDIX-17. (continued) Interview Answers

Answer: Positively, I would say. The tranquillity of the water taxi rides offers a moment of calm before the start of a busy day, which has been beneficial for my mental well-being. However, the reliance on multiple modes of transport to complete a journey does introduce some stress, particularly when connections between them are tight or delayed.

Perceived Solutions and Improvements

Question: From your perspective, what improvements or solutions would most significantly enhance your public transport experience and reduce social exclusion?

Answer: Expanding the water taxi network, increasing the frequency of service, and ensuring better integration with road-based public transport options would greatly enhance the commuting experience. Additionally, improving the infrastructure at docks, such as better lighting, security, and waiting areas, would make transitions between different modes of transport safer and more comfortable.

Interviewee 4

Daily Commute Experience

Question: Can you describe your daily commute using public transport in Abidjan?

Answer: My daily commute involves using a combination of gbakas (minibuses) and the occasional taxi. The journey from home to work typically takes about an hour, but it can extend much longer during peak hours. The buses are often overcrowded, and finding a seat can be a struggle, especially during rush hours.

Accessibility and Affordability

Question: How accessible and affordable is public transport for you?

Answer: Public transport is relatively accessible from my location, but affordability is a concern. The cost of daily commutes adds up, making a significant dent in my monthly budget. There are days when I have to choose between spending on transportation and other essential expenses.

Safety and Security Concerns

Question: Have you encountered any safety or security issues while using public transport?

APPENDIX-17. (continued) Interview Answers

Answer: Safety and security are major concerns for me and many other women I know. Instances of harassment on public transport aren't uncommon. These experiences range from verbal harassment to more threatening behaviour. There's also the concern about pickpocketing in crowded buses. These issues significantly impact my sense of security and, at times, dictate my decision to avoid certain activities or events, especially if they require traveling late in the evening.

Impact on Employment and Opportunities

Question: Has your experience with public transport affected your employment opportunities or job choices?

Answer: Yes, transportation challenges have impacted my employment choices. I've had to turn down job opportunities that were either too far from reliable transport routes or required commuting late at night. The perception of safety on public transport directly influences such decisions, as it does for many women, limiting our access to certain job markets and professional growth opportunities.

Family and Social Life

Question: How does your reliance on public transport affect your family and social life?

Answer: My reliance on public transport has definitely affected my social and family life. There are numerous social gatherings, family events, and even essential errands that I've had to miss out on due to concerns about commuting back home safely afterward. It often feels like a choice between maintaining social connections and ensuring personal safety.

Health and Well-being

Question: Has your health or well-being been impacted by your daily use of public transport?

Answer: The daily stress of navigating public transportation, along with safety concerns, takes a toll on my health and well-being. The physical exhaustion from long commutes and the mental stress of constant vigilance against potential harassment or theft are draining. There's also the concern about exposure to pollution while waiting at bus stops or walking through congested areas.

APPENDIX-17. (continued) Interview Answers

Perceived Solutions and Improvements

Question: From your perspective, what improvements or solutions would most significantly enhance your public transport experience and reduce social exclusion?

Answer: Improving safety and security on public transport would have a significant positive impact on women's mobility and inclusion. This could include measures like introducing women-only buses during peak hours, increasing security presence on buses and at stations, and implementing stricter measures against harassment. Additionally, making public transport more affordable and routes more accessible would greatly enhance women's participation in OOH activities, thereby fostering greater social inclusion.

Interviewee 5

Daily Commute Experience

Question: Can you describe your daily commute using public transport in Abidjan?

Answer: My daily commute is predominantly on foot. I live relatively close to my workplace, which allows me to enjoy a 30-minute walk each morning and evening. This not only saves money but also immerses me in the city's vibrant street life. For destinations beyond walking distance, I depend on inter-communal taxis. These are more convenient for reaching specific areas not covered by the main public transport routes, although waiting times can be unpredictable.

Accessibility and Affordability

Question: How accessible and affordable is public transport for you?

Answer: Walking is, of course, the most affordable option, costing nothing but time. Inter-communal taxis offer a reasonably priced alternative for longer distances, fitting well within my budget. However, their accessibility varies greatly depending on the time of day and the specific route I need to take.

Safety and Security Concerns

Question: Have you encountered any safety or security issues while using public transport?

APPENDIX-17. (continued) Interview Answers

Answer: Walking in Abidjan presents certain safety concerns, particularly in areas with poor lighting or limited sidewalks. I'm always cautious, especially after dark, to avoid accidents or security issues. In inter-communal taxis, while I've generally felt safe, the condition of some vehicles and the driving habits of certain drivers can be worrying.

Impact on Employment and Opportunities

Question: Has your experience with public transport affected your employment opportunities or job choices?

Answer: Absolutely. I've chosen jobs that are within walking distance, significantly narrowing my options. While this has helped maintain my health and reduce expenses, it has limited my professional choices to a small geographical area.

Family and Social Life

Question: How does your reliance on public transport affect your family and social life?

Answer: My mobility choices have influenced my social interactions. I tend to socialize more within my neighborhood or in areas easily accessible on foot. While this has fostered a strong sense of community, it sometimes means missing out on events or gatherings that are too far to walk to and not easily accessible by inter-communal taxi.

Health and Well-being

Question: Has your health or well-being been impacted by your daily use of public transport?

Answer: Walking daily has been excellent for my physical health and mental well-being. It's a stress reliever and a way to stay physically active. However, exposure to pollution and the physical toll of walking in extreme weather conditions are downsides.

Perceived Solutions and Improvements

Question: From your perspective, what improvements or solutions would most significantly enhance your public transport experience and reduce social exclusion?

APPENDIX-17. (continued) Interview Answers

Answer: Improving pedestrian infrastructure would make a significant difference—more sidewalks, pedestrian crossings, and better lighting would enhance safety and encourage walking. For inter-communal taxis, establishing more organized routes and schedules could improve reliability and accessibility, making it easier to plan commutes without extensive waiting times.

Interviewee 6

Daily Commute Experience

Question: Can you describe your daily commute using public transport in Abidjan?

Answer: My daily commute is quite challenging. I rely on public transport to get to my job, which involves a combination of walking to the nearest bus stop and then taking a gbaka, which is often overcrowded. My commute can take anywhere from one to two hours, depending on traffic and the availability of transport. The unpredictability of the transportation schedule adds a layer of complexity to planning my day.

Accessibility and Affordability

Question: How accessible and affordable is public transport for you?

Answer: For someone with a limited income, the costs associated with public transport can take up a significant portion of my monthly budget. While public transport is theoretically accessible, the reality is that delays, inconsistencies, and the costs sometimes make it prohibitive, forcing me to walk long distances instead.

Safety and Security Concerns

Question: Have you encountered any safety or security issues while using public transport?

Answer: The safety and security concerns on public transport and during commutes are not negligible. The risk of theft or harassment is higher, especially in overcrowded conditions or when walking through unsafe neighbourhoods. These concerns add an additional layer of stress to daily life.

APPENDIX-17. (continued) Interview Answers

Impact on Employment and Opportunities

Question: Has your experience with public transport affected your employment opportunities or job choices?

Answer: The state of public transportation directly affects my employment opportunities. Jobs that require early morning or late evening travel are often not feasible options due to the unreliability of transport services during those hours. This limitation restricts my ability to seek better employment or engage in other activities that could improve my economic situation.

Family and Social Life

Question: How does your reliance on public transport affect your family and social life?

Answer: My family and social life are significantly impacted by the transportation challenges. Participating in social activities, visiting family, or attending important events can be difficult. Often, I have to decline invitations to gatherings or community events because the cost or the logistical challenges of getting there and back are too daunting.

Health and Well-being

Question: Has your health or well-being been impacted by your daily use of public transport?

Answer: The physical toll of long, arduous commutes and the mental stress associated with navigating an unreliable and inadequate transportation system cannot be understated. Exposure to pollution, standing for long periods, and the general wear and tear of daily commuting exacerbate health issues over time.

Perceived Solutions and Improvements

Question: From your perspective, what improvements or solutions would most significantly enhance your public transport experience and reduce social exclusion?

Answer: Improvements in public transportation infrastructure could dramatically improve the lives of low-income residents like myself. Affordable, reliable, and safe public transport options would not only facilitate better access to employment opportunities but also enhance participation in social and community activities, reducing the risk of social exclusion. Additionally, targeted subsidies or reduced fares for low-income individuals could help alleviate the financial burden of commuting.

APPENDIX-17. (continued) Interview Answers

Interviewee 7

Daily Commute Experience

Question: Can you describe your daily commute using public transport in Abidjan?

Answer: My daily commute mostly involves using public transport, specifically gbakas (minibuses) and shared taxis, as they are the most affordable options available to me. The journey can be quite long and cumbersome due to the need to switch between different modes of transport to reach my destination.

Accessibility and Affordability

Question: How accessible and affordable is public transport for you?

Answer: Public transportation is the most accessible option for my daily needs, albeit with its challenges such as delays and overcrowding. The affordability of public transport is crucial for me, as my limited income does not allow for the luxury of more comfortable, private transport options.

Safety and Security Concerns

Question: Have you encountered any safety or security issues while using public transport?

Answer: Safety and security on public transport are constant concerns. Overcrowded buses and informal transport settings sometimes expose me to situations where I feel unsafe. These concerns have occasionally forced me to miss or cancel activities, especially those occurring in the evenings or in less accessible locations.

Impact on Employment and Opportunities

Question: Has your experience with public transport affected your employment opportunities or job choices?

Answer: My educational background has significantly impacted the type of job opportunities available to me, most of which require daily commuting using public transportation. There have been instances where I had to decline job offers or other opportunities because the transportation logistics were too complicated or unreliable.

APPENDIX-17. (continued) Interview Answers

Family and Social Life

Question: How does your reliance on public transport affect your family and social life?

Answer: My participation in social and family activities is often hindered by my transportation limitations. Events that are far from main transport routes or require travel late at night are particularly challenging. As a result, I find myself missing out on gatherings and community events more often than I would like.

Health and Well-being

Question: Has your health or well-being been impacted by your daily use of public transport?

Answer: The stress and physical demands of relying on public transportation, combined with the financial strain of commuting costs, impact my overall health and well-being. The cumulative effect of navigating these daily challenges can be quite taxing.

Perceived Solutions and Improvements

Question: From your perspective, what improvements or solutions would most significantly enhance your public transport experience and reduce social exclusion?

Answer: Improving the quality and reliability of public transportation could significantly enhance the daily lives of individuals like me. Additionally, educational programs that provide information on navigating the city's transport system efficiently and safely could help in making more informed transportation choices.

Interviewee 8

Daily Commute Experience

Question: Can you describe your daily commute using public transport in Abidjan?

Answer: Most days, I commute using my personal car, which offers me the flexibility to travel directly to my destinations at any time of day. My commute time can vary significantly depending on traffic, ranging from 20 minutes to over an hour for the same distance. On days when I anticipate heavy traffic or when I have meetings in particularly congested parts of the city, I opt for metered taxis to avoid the stress of driving and parking in those areas. This usually means planning ahead to factor in the waiting time for a taxi and the potential for traffic delays.

APPENDIX-17. (continued) Interview Answers

Accessibility and Affordability

Question: How accessible and affordable is public transport for you?

Answer: Using my personal vehicle is convenient and accessible for my needs, but the costs associated with maintenance, fuel, and occasional parking fees can add up. Metered taxis, while relatively accessible, especially in central areas, come at a higher cost compared to other forms of public transport like buses or minibusses. However, the trade-off in convenience and time savings often justifies the expense for me.

Safety and Security Concerns

Question: Have you encountered any safety or security issues while using public transport?

Answer: Driving my own car feels relatively safe in terms of personal security, but navigating through heavy traffic and occasionally unpredictable driving behavior from others can be a safety concern. In metered taxis, I generally feel safe, although I am cautious about choosing reputable taxi services, especially when traveling alone or at night.

Impact on Employment and Opportunities

Question: Has your experience with public transport affected your employment opportunities or job choices?

Answer: Having a personal vehicle has not significantly limited my employment choices, as I'm able to commute across different parts of the city. However, the reliance on a car does influence my consideration of job locations based on parking availability and traffic conditions. It's a factor in my overall assessment of job opportunities.

Family and Social Life

Question: How does your reliance on public transport affect your family and social life?

Answer: My ability to drive a personal vehicle or take a taxi facilitates attending family and social events across Abidjan without much restriction. The main limitation is navigating through traffic, which sometimes requires leaving earlier than I'd prefer to ensure on-time arrivals at gatherings.

Health and Well-being

Question: Has your health or well-being been impacted by your daily use of public transport?

APPENDIX-17. (continued) Interview Answers

Answer: The stress associated with driving in heavy traffic can be taxing, both mentally and physically, especially during long commutes. Opting for taxis during peak traffic times helps mitigate this stress to some extent, providing opportunities to relax instead of focusing on the road.

Perceived Solutions and Improvements

Question: From your perspective, what improvements or solutions would most significantly enhance your public transport experience and reduce social exclusion?

Answer: Enhancing the efficiency and coverage of public transport systems

Interviewee 9

Daily Commute Experience

Question: Can you describe your daily commute using public transport in Abidjan?

Answer: My commute involves a lengthy journey on public transportation, taking up to two hours each way. This includes walking to the nearest bus stop, waiting for the bus, and sometimes transferring to another bus or a shared taxi to reach my workplace. The long commute is a significant part of my daily routine.

Accessibility and Affordability

Question: How accessible and affordable is public transport for you?

Answer: Given the distance between my home and workplace, public transport is the most viable option for me. While it's accessible in terms of availability, the cost and time involved make the commute challenging. The affordability of public transport is critical, as private vehicle ownership or frequent taxi use is beyond my financial reach.

Safety and Security Concerns

Question: Have you encountered any safety or security issues while using public transport?

Answer: Traveling long distances, especially during early morning or late evening hours, raises safety and security concerns. Overcrowded buses and waiting at isolated bus stops can be particularly anxiety-inducing. These concerns have sometimes led me to miss or cancel participation in activities, especially those occurring outside regular commuting hours.

APPENDIX-17. (continued) Interview Answers

Impact on Employment and Opportunities

Question: Has your experience with public transport affected your employment opportunities or job choices?

Answer: The distance from my workplace limits my employment options and affects my participation in professional development activities. I have had to decline opportunities for additional training or networking events that do not align with public transport schedules or would require late travel.

Family and Social Life

Question: How does your reliance on public transport affect your family and social life?

Answer: Living far from my workplace and relying on public transport significantly impacts my family and social life. The commute consumes a considerable portion of my day, leaving less time for family interactions and social engagements. Consequently, I often miss out on family events, social gatherings, and community activities.

Health and Well-being

Question: Has your health or well-being been impacted by your daily use of public transport?

Answer: The extended commute and reliance on public transportation affect my physical health and mental well-being. The stress of daily long commutes, combined with the physical exhaustion of standing in buses or walking to and from stops, contributes to overall fatigue and stress.

Perceived Solutions and Improvements

Question: From your perspective, what improvements or solutions would most significantly enhance your public transport experience and reduce social exclusion?

Answer: Improving the efficiency and coverage of public transportation would greatly benefit individuals like me who live far from their workplaces. Initiatives such as express bus services, better scheduling, and enhanced safety measures at bus stops could make public transport a more appealing and reliable option. Additionally, flexible work arrangements, such as telecommuting options, could alleviate the need for daily long-distance commuting.

APPENDIX-17. (continued) Interview Answers

Interviewee 10

Daily Commute Experience

Question: Can you describe your daily commute using public transport in Abidjan?

Answer: My daily commute is primarily on my personal motorcycle, which allows me to weave through Abidjan's traffic more effectively than a car would, significantly reducing my travel time. However, for certain parts of the city where parking is a hassle or when my destination is more conveniently reached by a specific route only served by informal transport, I rely on gbakas or woro-woros. This mix gives me flexibility, though it requires a bit more planning to ensure smooth transitions between modes.

Accessibility and Affordability

Question: How accessible and affordable is public transport for you?

Answer: Riding a motorcycle provides a high level of accessibility and time efficiency, with the main costs being fuel and maintenance. Informal public transport, like gbakas and woro-woros, is very affordable and accessible from major points in the city, though it comes with the unpredictability of wait times and varying levels of comfort.

Safety and Security Concerns

Question: Have you encountered any safety or security issues while using public transport?

Answer: Navigating traffic on a motorcycle carries inherent risks, especially considering the sometimes chaotic traffic conditions in Abidjan. I'm always vigilant to minimize safety risks. In gbakas and woro-woros, while I haven't faced direct security issues, the crowded conditions and variable vehicle conditions sometimes raise safety concerns.

Impact on Employment and Opportunities

Question: Has your experience with public transport affected your employment opportunities or job choices?

Answer: My mixed mode of transportation hasn't significantly limited my employment opportunities. If anything, the agility of my motorcycle combined with the extensive network of gbakas and woro-woros ensures I can reach almost any part of the city, making me more open to job opportunities in different areas.

APPENDIX-17. (continued) Interview Answers

Family and Social Life

Question: How does your reliance on public transport affect your family and social life?

Answer: The flexibility of my transportation options allows me to maintain a vibrant social and family life. I can easily decide on the most efficient mode of transport based on the time, destination, and who I'm meeting, ensuring I can make the most out of my day without transportation being a limiting factor.

Health and Well-being

Question: Has your health or well-being been impacted by your daily use of public transport?

Answer: Riding a motorcycle has its physical demands, which can be tiring but also keep me somewhat active. However, the stress of navigating traffic can be high. Utilizing informal public transport provides a break from these demands, though the crowded conditions can be less than ideal for mental well-being during peak hours.

Perceived Solutions and Improvements

Question: From your perspective, what improvements or solutions would most significantly enhance your public transport experience and reduce social exclusion?

Answer: Improving the integration between different modes of transport would greatly enhance the commuting experience. This could include dedicated lanes for motorcycles and bicycles, better-regulated informal transport systems with standardized routes and schedules, and safer, more comfortable facilities for transitions between modes. Enhancing road safety measures and providing more information on routes and schedules for informal transport would also make commuting safer and more predictable for everyone.

Interviewee 11

Daily Commute Experience

Question: Can you describe your daily commute using public transport in Abidjan?

APPENDIX-17. (continued) Interview Answers

Answer: On a typical day, my commute begins with a walk to the nearest bus stop, followed by a 30-minute ride on one of the city's fixed-route buses. This part of my journey is generally straightforward, though subject to the usual delays during peak traffic hours. For meetings or errands that fall outside the bus routes or when time is of the essence, I switch to using a VTC service. The seamless transition between these modes allows me to navigate the city's complex transportation landscape with relative ease.

Accessibility and Affordability

Question: How accessible and affordable is public transport for you?

Answer: The bus service is both accessible and affordable, forming the backbone of my daily commuting routine. It provides a cost-effective way to cover significant distances across the city. VTC services, while more expensive, offer value through their convenience and the time savings they afford, especially during off-peak hours when rates are more competitive.

Safety and Security Concerns

Question: Have you encountered any safety or security issues while using public transport?

Answer: The bus service feels safe overall, thanks to the presence of conductors and the structured nature of the routes. My primary concern tends to be the crowded conditions during rush hour, which can feel overwhelming. With VTC services, safety is less of a concern due to the personalized nature of the service and the ability to share trip details with contacts. However, I remain vigilant about choosing well-rated drivers and services.

Impact on Employment and Opportunities

Question: Has your experience with public transport affected your employment opportunities or job choices?

Answer: My mixed-use of bus services and VTCs has not significantly limited my employment choices. This flexibility ensures that I can reach most parts of the city without being overly reliant on one form of transport, making it feasible to consider opportunities that might otherwise have been logistically challenging.

Family and Social Life

Question: How does your reliance on public transport affect your family and social life?

APPENDIX-17. (continued) Interview Answers

Answer: This dual-mode approach to commuting has been beneficial for maintaining an active social and family life. It allows me to plan my travel efficiently, whether it's getting to family events on time using a VTC or meeting friends in areas well-served by the bus network.

Health and Well-being

Question: Has your health or well-being been impacted by your daily use of public transport?

Answer: The walking involved in getting to and from bus stops adds a welcome physical component to my routine, contributing positively to my health. While the convenience of VTCs reduces physical activity, it lowers commuting stress, especially on days filled with appointments or errands, positively affecting my mental well-being.

Perceived Solutions and Improvements

Question: From your perspective, what improvements or solutions would most significantly enhance your public transport experience and reduce social exclusion?

Answer: Enhancing the connectivity between different modes of public transport, including buses and VTCs, through integrated ticketing systems and real-time information apps, would streamline the commuting experience. Investing in infrastructure improvements, such as dedicated bus lanes and better-maintained stops, would improve the reliability and appeal of bus services. For VTCs, implementing dynamic pricing caps during peak hours could make them a more accessible option for a broader range of commuters.

APPENDIX-18. Interview Questions

INTERVIEW QUESTIONS AND AIMS

Research student: Bassirou BANDE, PhD candidate Gazi University, Ankara/Turkey

Supervisor: Prof. Dr. Hülügü KAPLAN, Gazi University/Faculty of Architecture
Dept. of City and Regional Planning

Research Objective: This study aims to explore transport issues and their role in daily mobility and activity participation in selected case study sites of Abidjan District. It uses the qualitative methodology of interview with adult respondents.

NB: Participation in the interview is totally voluntary and you can stop answering at any time during the survey. Your identity information will not be shared; the data will be used only for educational purposes.

Background and Overview

Can you provide an overview of Abidjan's current transportation system?

Aim to understand the infrastructure's scope, including public, private, and informal transport modes, and their roles in the city's mobility landscape.

What are the main challenges facing Abidjan's transportation system today?

Explore issues like congestion, accessibility, infrastructure maintenance, and integration between different modes of transport.

Social Exclusion and Transportation

How does the current transportation system contribute to or mitigate social exclusion in Abidjan?

This question seeks insights into the ways transportation accessibility or lack thereof impacts various communities, particularly marginalized or vulnerable groups.

Can you share examples of transportation policies or initiatives specifically designed to address social exclusion?

APPENDIX-18. (continued) Interview Questions

Look for programs aimed at improving accessibility for the disabled, affordability for low-income residents, or connectivity for isolated neighbourhoods.

Policy and Planning Insights

What role do urban planning and transportation policy play in promoting social inclusion?

This aims to understand the strategic importance of inclusive planning principles and policy-making in creating equitable urban mobility solutions.

How are informal transportation networks integrated into the city's transportation planning?

Given the significant role of informal transport modes in Abidjan, explore efforts to formalize these systems or incorporate them into broader urban mobility strategies.

Innovations and Future Directions

What innovative approaches are being considered or implemented to improve transportation equity in Abidjan?

Look for information on smart transportation solutions, public-private partnerships, or community-based initiatives.

Considering future urban growth, how is Abidjan planning to ensure its transportation system evolves to meet the needs of all its residents?

This question should reveal long-term planning considerations, anticipated infrastructure projects, and strategies to enhance mobility and reduce social exclusion.

Challenges and Opportunities

What are the primary obstacles to implementing inclusive transportation policies in Abidjan?

Identify common challenges, such as funding limitations, regulatory hurdles, or resistance from certain stakeholders.

APPENDIX-18. (continued) Interview Questions

How can international experiences in addressing TRSE inform policy-making in Abidjan?
Explore openness to learning from global best practices and adapting them to the local context.

Personal Insight and Reflection

From your experience, what key factors ensure the success of policies aimed at reducing TRSE?

Seek personal reflections on the elements crucial for policy effectiveness, such as community engagement, inter-sectoral collaboration, or data-driven decision-making.

APPENDIX-19. Manufacturing better correlated with urbanization

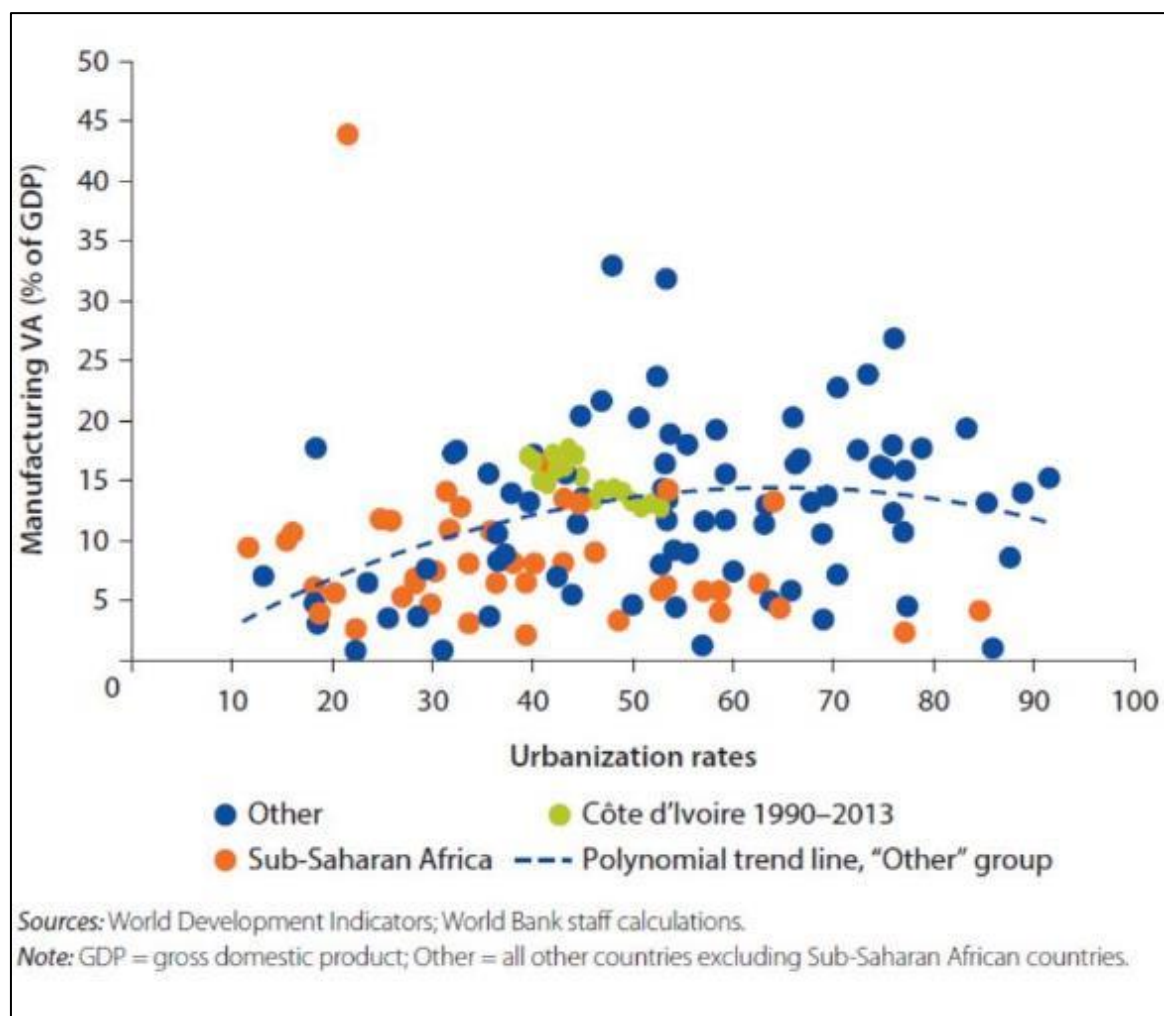


Figure 8. Manufacturing correlated with urbanization rates

APPENDIX-20. The population gap between Abidjan and other Ivorian cities has widened since 1975

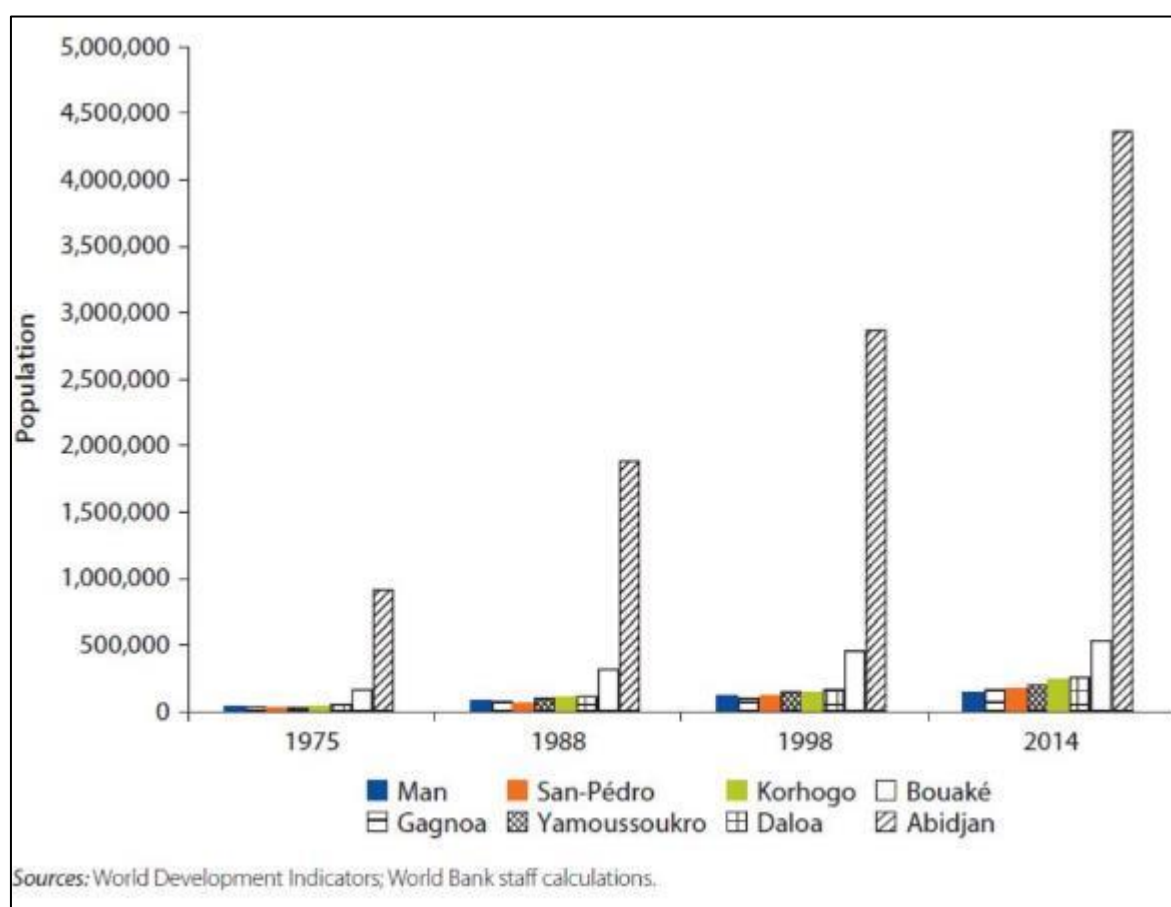


Figure 9. The population gap between Abidjan and other Ivorian cities has widened since 1975

APPENDIX-21. Planning cycle for a Sustainable Urban Mobility Plan



Figure 10. Planning cycle for a Sustainable Urban Mobility Plan



Gazili olmak ayrıcalıktır