15-MİNUTE CİTY: A CASE STUDY İN KÜÇÜKÇEKMECE, ISTANBUL

ESCUELA TÉCNICA SUPERIOR DE INGENIERÍA GEODÉSICA CARTOGRÁFICA Y TOPOGRÁFICA

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INTRODUCTION

Why this case. The 15-minute city seeks everyday needs within a short, safe walk, with longer trips linked to public transport. Suburban districts are harder: larger blocks, gated fronts and big roads. **Aim**: Measure who in Küçükçekmece can reach key services within 15 minutes on foot, diagnose where and why access fails, and turn the findings into a short, actionable plan.
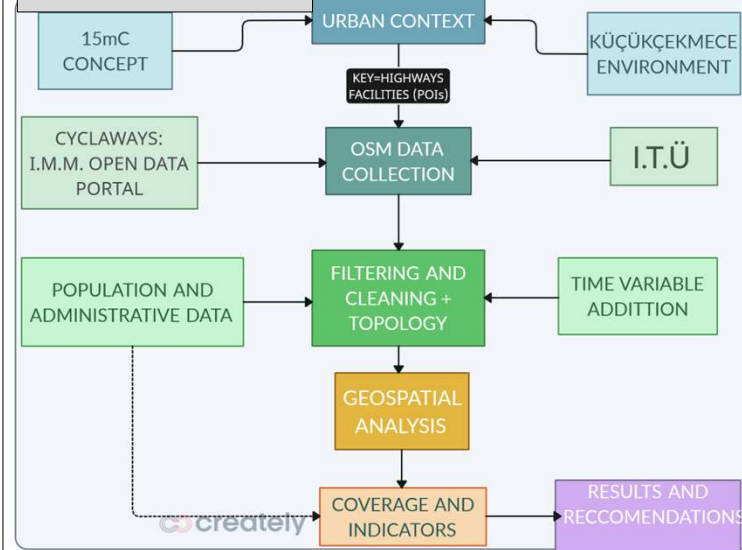
OBJETIVOS

PRIMARY OBJECTIVE:
- Measure 15-minute walking access to everyday services and identify block-level fixes and siting moves to close the gaps.

SPECIFIC OBJECTIVES:
- Build a clean **walkable network** (4 km/h).
- Map **15-minute areas** for each service (healthcare, pharmacies, education, supermarkets, social centres, parks, bus/Metrobüs stops).
- **Intersect** with residential land to estimate **population covered** by neighbourhood.
- **Classify gaps** (missing services vs. detours/poor crossings).
- **Validate** with Closest Facility routes at suspicious edges.
- Summarise into **simple KPIs** and **strategic actions**.

METHODOLOGY

15mC CONCEPT → URBAN CONTEXT ← KÜÇÜKÇEKMECE ENVIRONMENT

KEY=HIGHWAYS FACILITIES (POIs)

CYCLAWAYS: I.M.M. OPEN DATA PORTAL → OSM DATA COLLECTION ← I.T.Ü

POPULATION AND ADMINISTRATIVE DATA → FILTERING AND CLEANING + TOPOLOGY ← TIME VARIABLE ADDITTION

GEOSPATIAL ANALYSIS

COVERAGE AND INDICATORS → RESULTS AND RECCOMENDATIONS

RESULTS

GREEN AREAS: 15min ISOCHRONES
GREEN SURFACE > 10.000 M2
Mode: WALKING
1:30.000
TUREF-30
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Legend: GREEN AREAS > 10.000 / 15min ISOCHRONE / FOOTWAYS / KÜÇÜKÇEKMECE

POPULATION W/ HEALTHCARE ACCESS (15min)
Mode: WALKING
1:30.000
TUREF-30
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Legend: HEALTHCARE FACILITIES / KÜÇÜKÇEKMECE / FOOTWAYS — POP. COVERED HEALTHCARE: 0-5.000 / 5.000-10.000 / 10.000-20.000 / 20.000-38.000 / 38.000-50.000 / 50.000-62.000

GAPS FROM 4 ESSENTIAL SERVICES
Classified by Accessibility
Mode: WALKING
1:30.000
TUREF-30
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Legend LEVEL OF ACCESIBILITY: 0 (none) / 1-2 (weak) / 3 (near-complete) / KÜÇÜKÇEKMECE / FOOTWAYS

CLASSIFIED GAPS FROM ALL SERVICES
Health-Education-Food-Pharma-Social-Bus-Green 1k
Mode: WALKING
1:30.000
TUREF-30
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Legend LEVEL OF ACCESIBILITY: 0-1 (none/very weak) / 2-3 (weak) / 4-5 (medium) / 6 (near-complete) / KÜÇÜKÇEKMECE / FOOTWAYS

RECOMMENDATIONS & CONCLUSIONS

- **Quick links & crossings** on the **eastern belt** and **NW seams** to remove detours.
- **Add one clinic** (or multi-use health point) in **Kanarya**; co-locate with the walking and bus spines.
- **Food retail**: encourage medium stores in **Kanarya** and the east; prioritise ground-floor fronts on main streets.
- **East-side Green Belt (flagship).** A shaded **walk+bike loop** connecting near-miss areas to services and to Metrobüs/Marmaray.
- **Most objectives met:** the method is replicable; mapping + coverage + validation produce clear, actionable gaps.
- **Track progress:** % residents ≤15′ by service; essentials score (0–4); all-services score (0–7); door-to-stop ≤5′; # new crossings/links; km of protected links.

KPIs

- % residents ≤15′ by service (walking).
- Essentials score 0–4 (healthcare, education, food, park).
- All-services score 0–7 (full set).
- Door-to-stop ≤5′ (bus/Metrobüs).
- New crossings/short links built.
- Km of protected walk/bike links added.
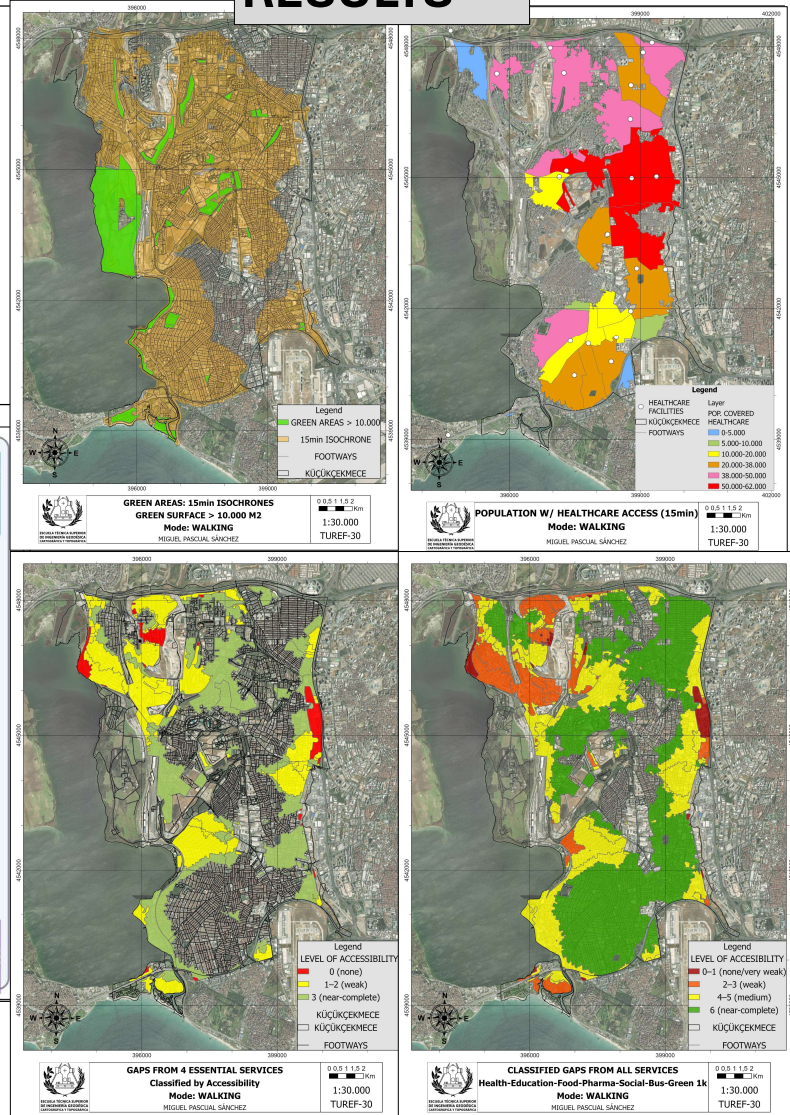
NOTES

- Walking SA: 15 minutes, 4 km/h, polygons+lines, dissolve, 50 m trim.
- Residential mask: excludes non-residential uses (industrial, parks/forest, cemeteries, rail, farmland), checked with imagery.
- Facilities: hospitals/clinics/doctors, pharmacies, schools, supermarkets, social centres, parks, bus/Metrobüs.
- Population: latest available neighbourhood totals (limited to residential land).
- Validation: Closest Facility on edge cases; if connectivity error → fix network → rebuild → rerun

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