Collaboration for on-line population registre

INTRODUCTION

The National Institute of Statistics, which depends on the Ministry of Economy, is responsible for the population and housing census and the population register

The General Directorate of Cadaster, which depends on the Ministry of Finance, is responsible for the inventory of all real estate in the country.

Both organizations signed a collaboration agreement for the exchange of information.

ADDRESSES

- The town councils are responsible for the official name of the municipality, streets names and house numbers (the entrance gate).
- This information is officially collected by the INE annually. These data are coded by INE.
- The town councils also provide information on streets and building numbers to the Cadaster.
- The Cadaster associates the street name and gate number information to each property and also adds the internal address (floor, door) and the georeferencing, usually of the gate or entrance.

POPULATION REGISTER

- In Spain residents must declare their place of residence to their city council: street name, gate number, floor, door.
- Town councils recollected this information and send it montly in a file to INE, who cross the information of different City councils and updates the population register .
- The population register contains information about which people or families live in each house or apartment, in a single file, mixed.

THE ONLINE POPULATION REGISTER PROJECT

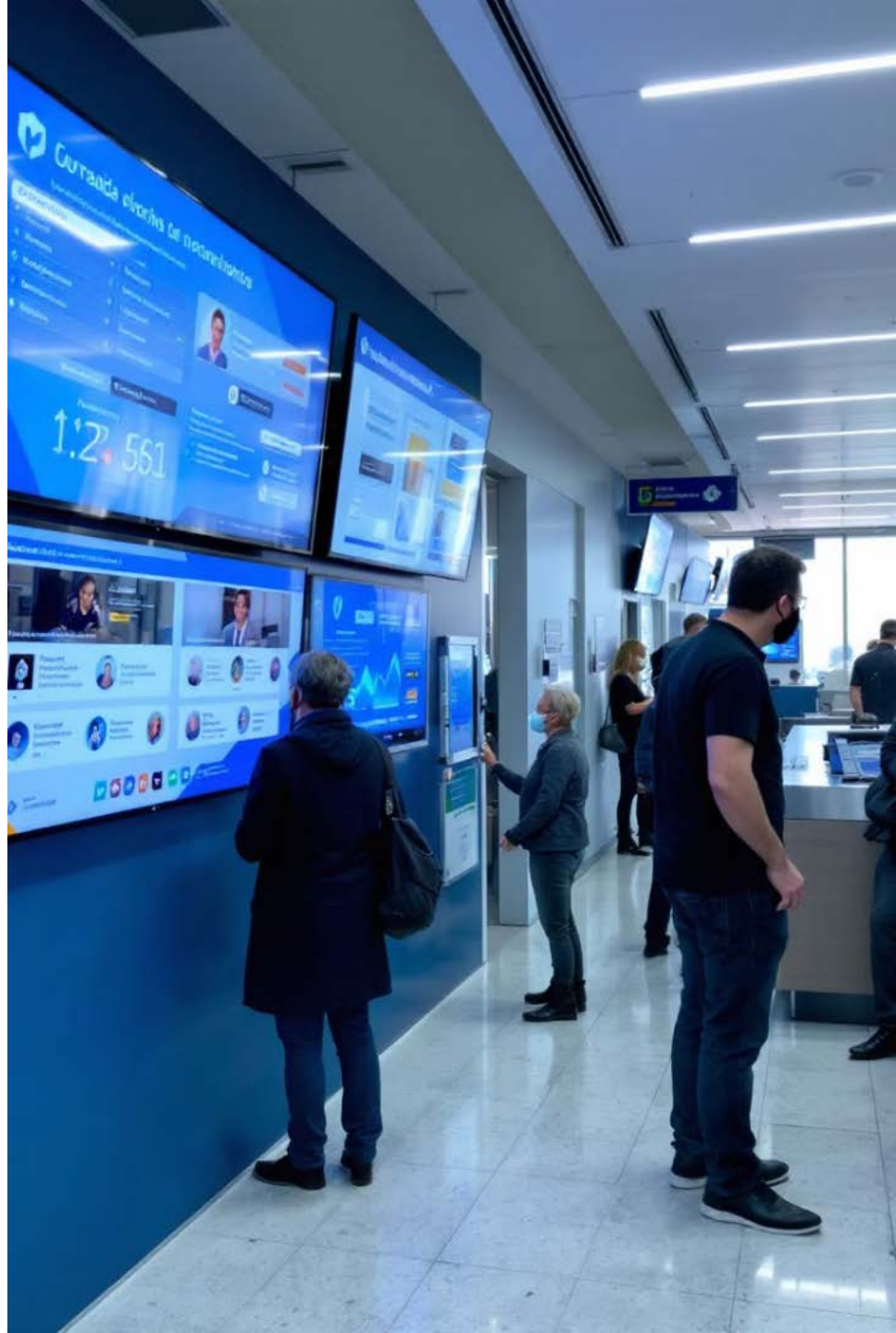
- The online population register project aims to separate homes and people, and to locate homes by their geolocation provided by the Cadastre.
- Furthermore, data updates must be instantaneous through mobile phone applications (API) or web services.
- The following slides contain details about the project, followed by an explanation of the work to improve the cadastral georeferenced addresses.
- Finally there are some explanatory diagrams

Online Municipal Registry: Modernization of the Resident Registration System

The Municipal Register is the foundation of Spanish local government, officially registering all residents in each municipality. This presentation explores the digital transformation of this vital system toward a more efficient and connected online model.

We will examine how the separation of territorial and personal data, along with the incorporation of cadastral references and real-time web services, is revolutionizing population management in Spain. We will explore the benefits, challenges, and the path toward full implementation of this ambitious project.

by Javier Luque



What is the Municipal Registry and its relationship with

Definition of the Municipal Register

Administrative registry listing the residents of a municipality. All people living in Spain are required to register in the municipality where they normally reside.

Municipal Responsibilities

The Municipal Register is created, maintained, reviewed, and safeguarded by the City Council. Its data constitutes proof of residence and habitual residence.

INE Census Base

To coordinate all Municipal Registers and avoid duplication, the INE maintains a census database composed of all the Registers, updated monthly with changes submitted by the City Councils.

This coordination is also carried out with the Registry of Spaniards Residing Abroad, thus ensuring a coherent national population information system that serves as the basis for multiple public services and demographic studies.

Fundamentals of the Online Registry Project

Separation of Information

The project separates territorial data from personal data, incorporating the cadastral reference as a key element for identifying homes. This allows for more precise and efficient information management.

The cadastral reference acts as a unique identifier for each home, facilitating coordination between different administrations and public services.

Real-Time Web Services

The monthly file-based sharing system is being abandoned in favor of one based on real-time web services, allowing for immediate updates and reducing errors.

This transformation represents a qualitative leap in the management of the Registry, facilitating interoperability between administrations and significantly improving response times.

These two elements represent a paradigm shift in the management of the Municipal Register, modernizing a fundamental system for Spanish local administration.

Advantages of the New System

Frequent Population Monitoring

Possibility of understanding population trends more frequently, allowing for more accurate and up-to-date demographic analyses.

Household Database

Creating a database of households (understood as cohabitants), not just individuals, improving understanding of family structures.

Unified Territorial Information

Availability of unified territorial reference information, facilitating coordination between different administrations.

Homogeneous Services

Ability to offer consistent services to citizens, regardless of the municipality where they reside.

These improvements represent a qualitative leap in census management, benefiting both public administrations and citizens with more efficient services and more accurate data.

Implementation in Two Key Actions

Action 1: New Territorial Management System

Implementation of a new system to manage information about each municipality's territory, completely separating this information from residents' personal data.

Action 2: Exchange through Web Services

Implementation of the project on the exchange of municipal registers of each municipality, through web services, between municipal registers and the INE.

Interadministrative Coordination

Establishment of coordination protocols between the various administrations involved to ensure data consistency and accuracy.

These actions represent the fundamental pillars of the project, which is being implemented gradually to minimize disruptions to the daily administrative management of Spanish municipalities.

Pilot Tests and Technical Development

Municipal Pilot Test

The INE designed the technical guide following a pilot test conducted in approximately 20 municipalities in five provinces within the common fiscal territory, which took place during the second half of 2023.

Objective of the Tests

To assess the extent to which municipalities could have valid starting territory files for census management, with a view to implementing the Online Register.

Try with Regional Cadastres

A pilot test is also currently underway with regional cadastres, which have many specific elements requiring specific adaptations.

Development of Technical Solutions

Identification and resolution of specific technical problems to ensure successful implementation at the national level.

The results of these pilot tests are essential for refining the system before its widespread implementation, allowing for the identification and resolution of problems specific to each type of administration.

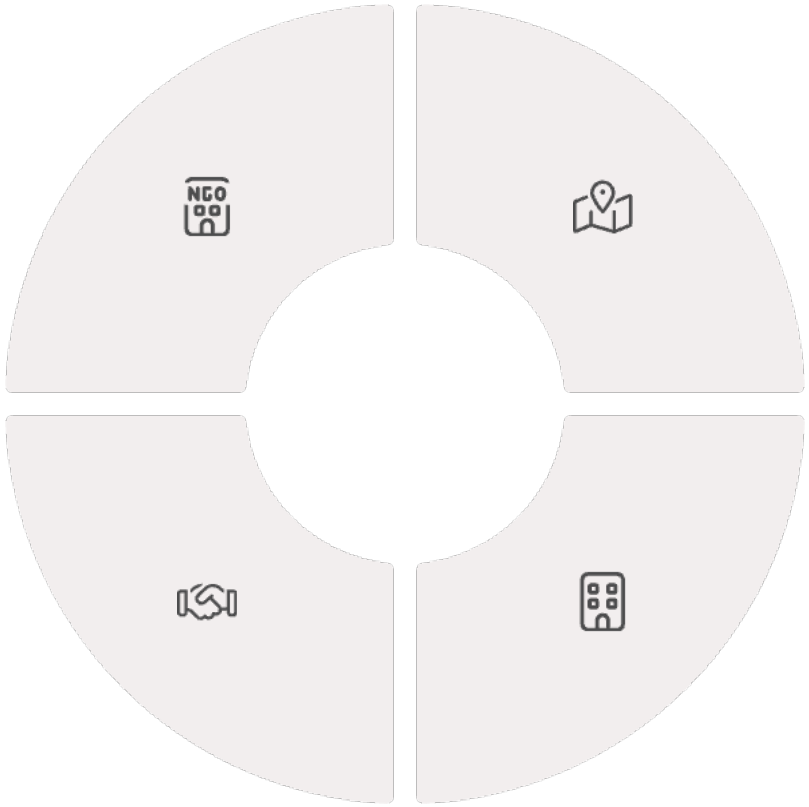
Multiple Agents Involved

General State Administration

INE, General Directorate of Cadastre, National Geographic Institute (IGN) and Ministry of Territorial Policy.

Technical Working Groups

Experts in data management, geographic information systems, and public administration collaborating on the design and implementation.



Autonomous Communities

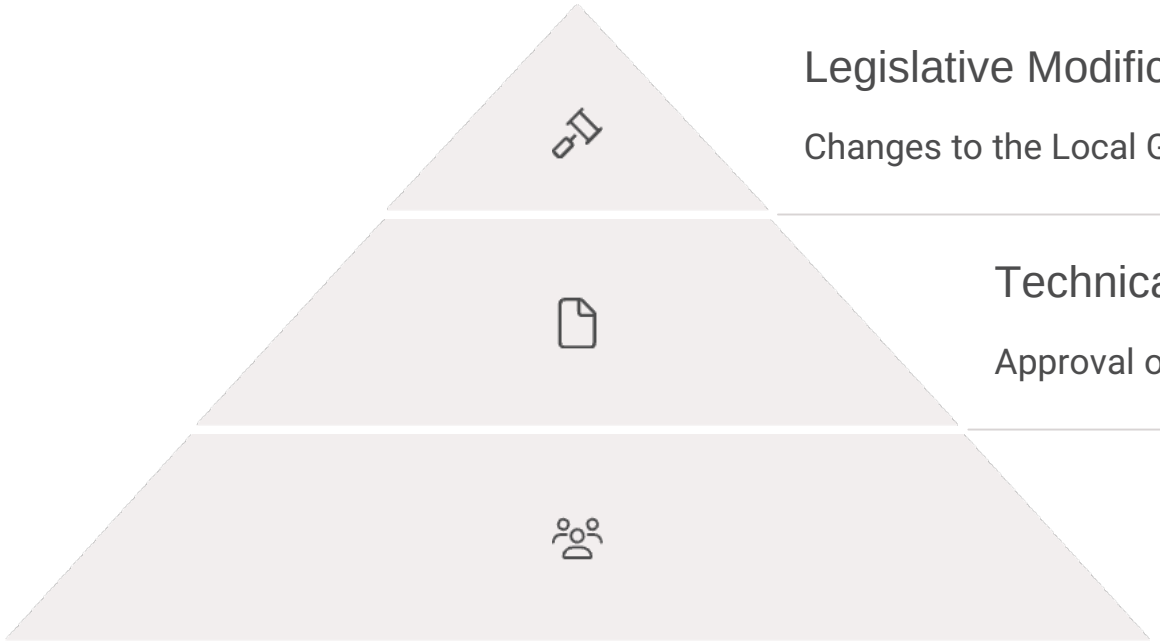
Mapping services and regional statistical offices provide specific data and coordinate implementation at the regional level.

Local Administration

Provincial councils and city councils are directly responsible for managing the Municipal Register in their territory.

Effective coordination among all these stakeholders is crucial to the project's success, requiring fluid communication channels and well-defined collaboration protocols that facilitate the transition to the new system.

Legislative and Technical Framework



Legislative Modifications

Changes to the Local Government Basic Law and the Population Regulations

Technical Instructions of the Registration Council

Approval of specific guidelines for management

Advisory Working Groups

Participation of experts from different administrations

The Online Register project is already reflected in current legislation, with amendments to both the Basic Law of the Local Government and the Population and Territorial Demarcation Regulations (RPDT) to accommodate this initiative. Article 85 of the RPDT establishes that one of the functions of the Registration Council is to approve the technical instructions necessary for managing the Registers.

To prepare proposals and efficiently manage change, advisory working groups have been established, bringing together experts from large and small municipalities, provincial councils, the General Directorate of Cadastre, and the Ministry of Foreign Affairs, among other relevant agencies.

Next Steps and Conclusions

Completion of Pilot Tests

Analysis of results and final adjustments

Gradual Implementation

Phased deployment according to municipal size

Training for Officials

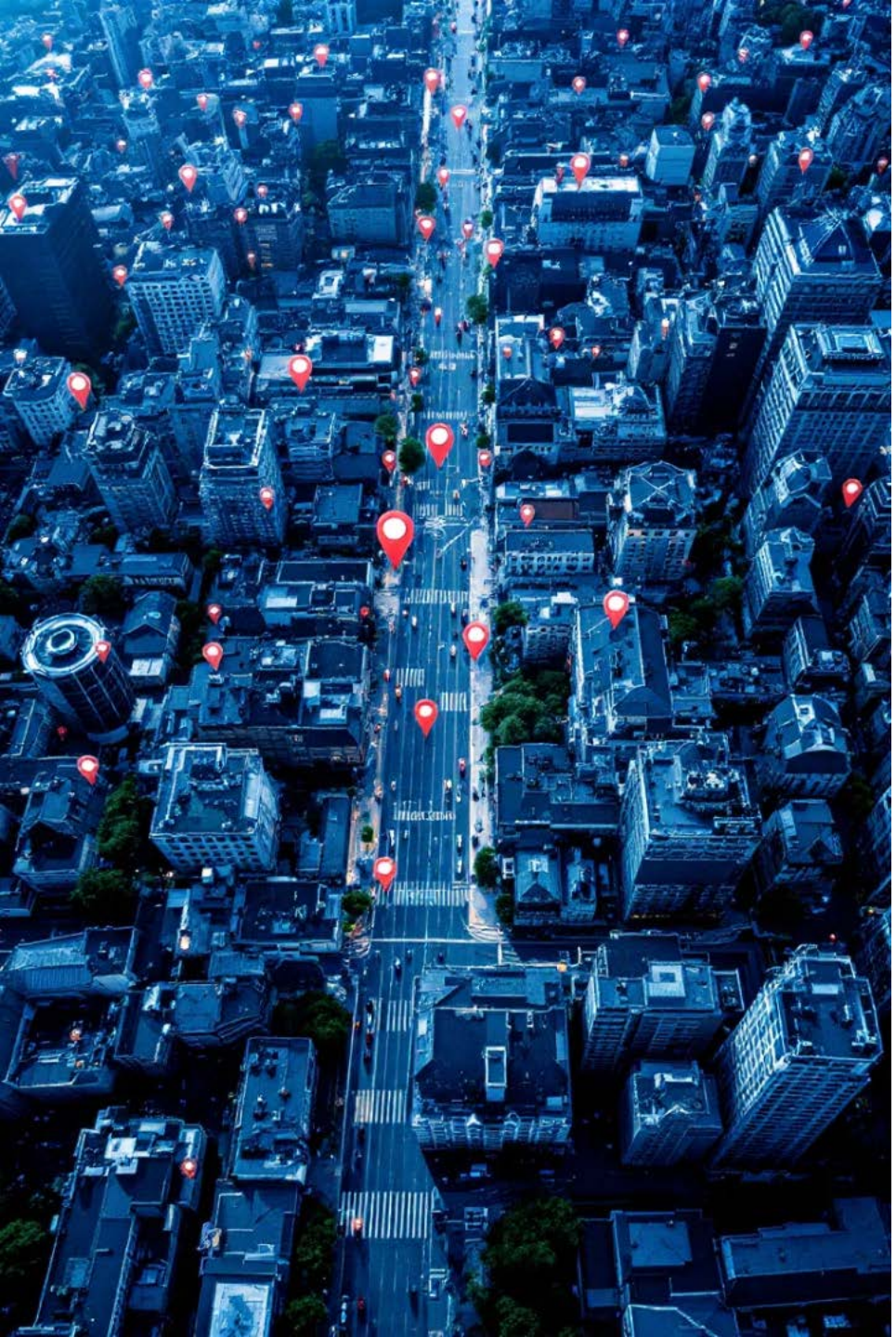
Technical training for the transition

Fully Operational System

Comprehensive operation of the new model

The Online Municipal Register represents a profound transformation in the administrative management of the population in Spain. The incorporation of the cadastral reference as a housing identifier and the real-time exchange system represent a significant advance in efficiency and accuracy.

Collaboration across multiple levels of the Spanish public administration is essential to the success of this project, which seeks to minimize the impact on current work dynamics while maximizing the benefits of the new system for both officials and citizens.

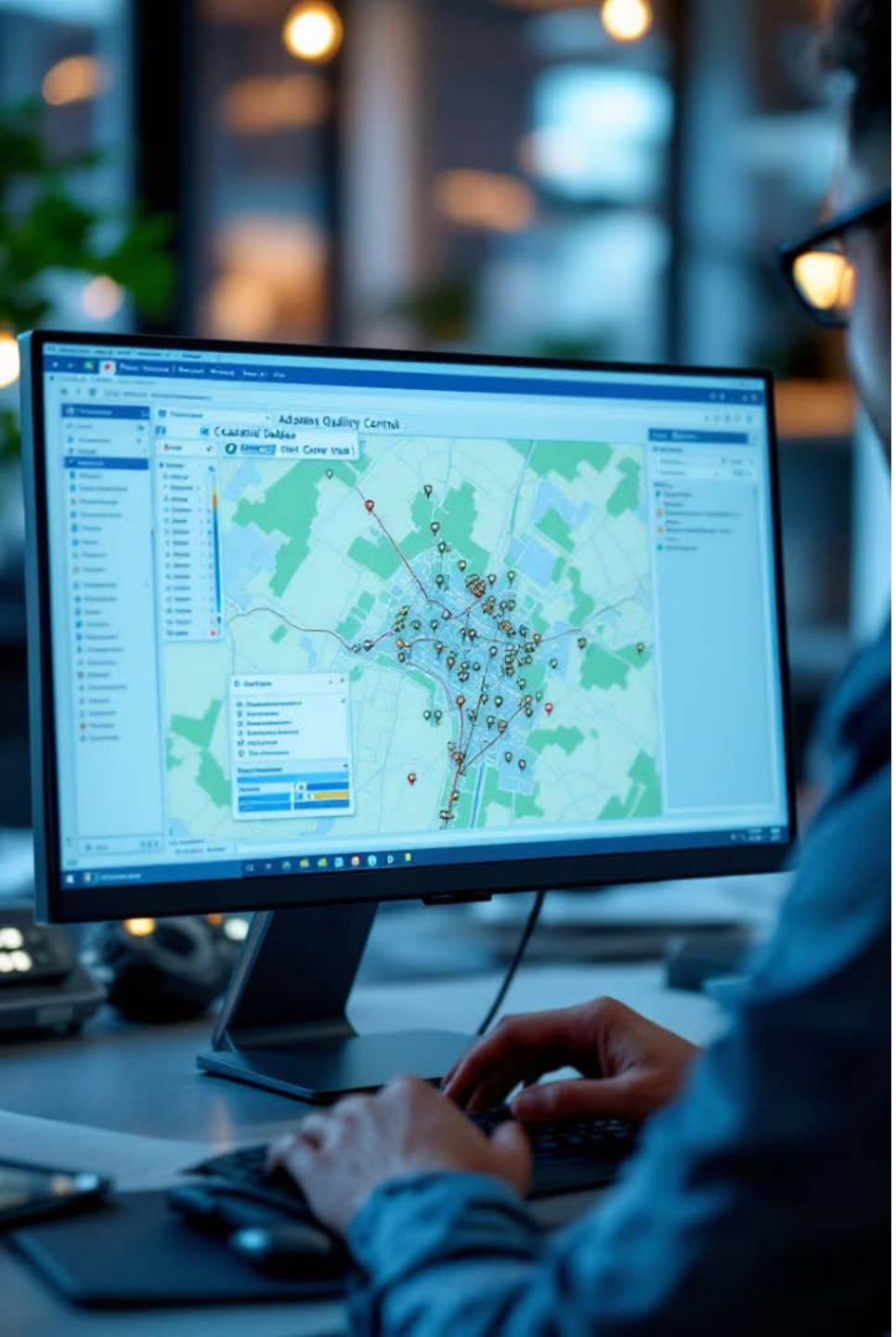


Georeferenced Postal Addresses: Quality and Improvement

The georeferencing of postal addresses has become a critical component in modern cadastral management, recognised by European institutions and international bodies for its significance in official datasets. These georeferenced addresses serve multiple national entities like the AEAT for tax campaigns, IGN for Cartociudad, INE for statistical purposes, and various law enforcement and postal services.

Internationally, Eurostat utilises these datasets to generate geolocated statistical information crucial for policymaking and resource allocation. The General Directorate of Cadastre has established rigorous quality control processes to evaluate and enhance the integrity of cadastral address data, systematically identifying and addressing discrepancies to maintain high standards of spatial information.

J **por Javier Luque**



Quality Control Processes for Address Data

Data Collection

Gathering address information from multiple authoritative sources including municipal records, postal services, and field surveys

Analysis

Implementing algorithms to detect inconsistencies, duplications, and georeferencing errors in the dataset

Correction

Rectifying identified issues through standardised protocols, involving manual verification when necessary

Validation

Confirming the accuracy of corrected data through cross-referencing with established standards and spatial integrity checks

The application of these sophisticated quality control mechanisms enables the identification of incidences in real estate address data that require revision. This systematic approach ensures the continuous improvement of the cadastral database, providing more reliable georeferenced information for all stakeholders.

Municipal-Level Address Analysis

Duplicate Detection

Advanced algorithms identify addresses with identical attributes within the same municipality, flagging potential duplications for review

Attribute Comparison

Systematic comparison of address components including street names, building numbers, postcodes, and coordinates to identify variations and inconsistencies

Spatial Analysis

Geospatial examination of address clusters to identify proximity-based duplications that may indicate data redundancy or inaccurate positioning

Statistical Evaluation

Quantitative assessment of duplicate frequency and patterns to prioritise correction efforts and identify systemic issues

Once the comprehensive set of geo-referenced addresses has been compiled, municipal-level analysis becomes essential to maintain data integrity. This process not only identifies redundancies but also ensures spatial accuracy and consistency across the cadastral system, contributing to more reliable and usable address information.

The Fundamentals of Address Georeferencing

Spatial Location

Georeferencing transforms textual address information into precise spatial coordinates, allowing direct physical location of properties

Correct georeferencing facilitates accurate navigation, emergency response, and service delivery to specific addresses

Data Integration

Properly georeferenced addresses can be integrated with other spatial datasets for enhanced analysis and decision-making

Integration enables cross-referencing with demographic, economic, and environmental data for comprehensive territorial management

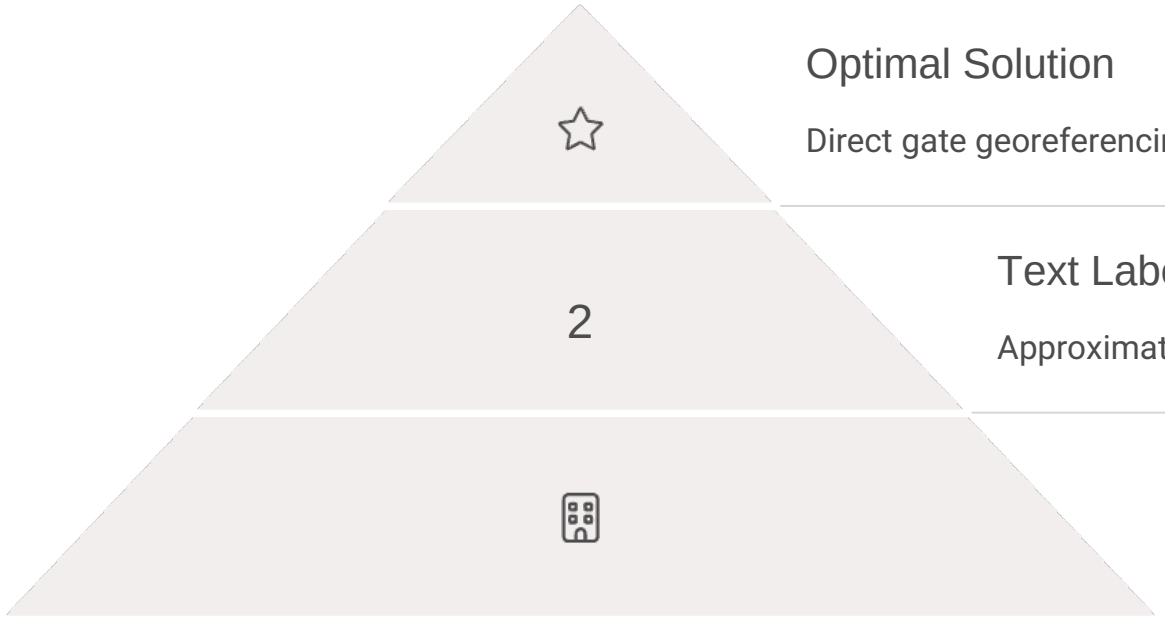
Quality Challenges

Incorrect georeferencing leads to difficulties in locating access points and identifying properties accurately

Errors can propagate through dependent systems, affecting postcode assignment, mail delivery, and emergency services response times

Georeferencing addresses is not merely a technical process but a fundamental component that determines the utility and reliability of spatial data. The accuracy of this process directly impacts numerous public and private services that rely on precise location information for their operations.

Current Georeferencing Methodologies



Optimal Solution

Direct gate georeferencing

Text Label Georeferencing

Approximate access point location

Parcel Centroid Georeferencing

Fallback method with lower precision

When generating address datasets from the cadastral database, georeferencing is achieved through the intersection of alphanumeric and graphic information. This process typically follows one of two paths: either locating a text label on the cartography that approximates the portal position, or defaulting to the plot centroid when no suitable text label (combining number and duplicate number, potentially with block information) can be found nearby.

The strategic objective is to enhance address georeferencing quality by significantly increasing the proportion of addresses referenced directly to their access portals via map labels, thereby reducing reliance on the less precise parcel centroid method. This improvement will deliver more accurate spatial representation of addresses throughout the cadastral system.

Improving Portal-Based Georeferencing

Identification

Locating addresses currently georeferenced to parcel centroids

Field Verification

On-site confirmation of actual portal locations

Database Update

Reconfiguring address references to utilise new portal labels

Label Creation

Adding precise cartographic text labels at portal positions

The transition from centroid-based to portal-based georeferencing represents a significant quality enhancement for the cadastral address system. This methodical process requires careful identification of properties currently using the less precise centroid method, followed by systematic field verification to establish the exact locations of building entrances and access points.

Implementing this improvement will result in more intuitive address location, enhanced navigation capabilities, and better integration with other spatial information systems that rely on precise access point locations rather than general property positions.

Road Name Unification Challenges

Problem Identification

Detection of roads with identical or slightly varied names but different road codes in the cadastral database

- Variations in articles, pronouns, and abbreviations
- Historical name changes maintaining multiple entries

VIA Table Analysis

Comprehensive examination of the VIA table to identify duplication patterns

- Cross-referencing with other cadastral tables
- Verification of population unit assignments

Consolidation Process

Methodical merging of duplicate records to standardise road identification

- Property reassignment to canonical road codes
- Preservation of historical references

The unification of road names is essential not only for internal cadastral maintenance but also for successful cross-referencing with municipal street maps and National Statistics Institute data. This consolidation addresses fundamental data quality issues that can impede efficient information exchange and spatial analysis.

INE Road Code Revision Process

Current State Assessment

Comprehensive review of existing INE road codes within the cadastral VIA table to identify outdated or incorrect entries that require updating

Evaluation of code completeness, including population unit identification components essential for accurate demographic and statistical applications

Cross-Reference Verification

Systematic comparison with authoritative INE road code databases to establish concordance and identify discrepancies requiring resolution

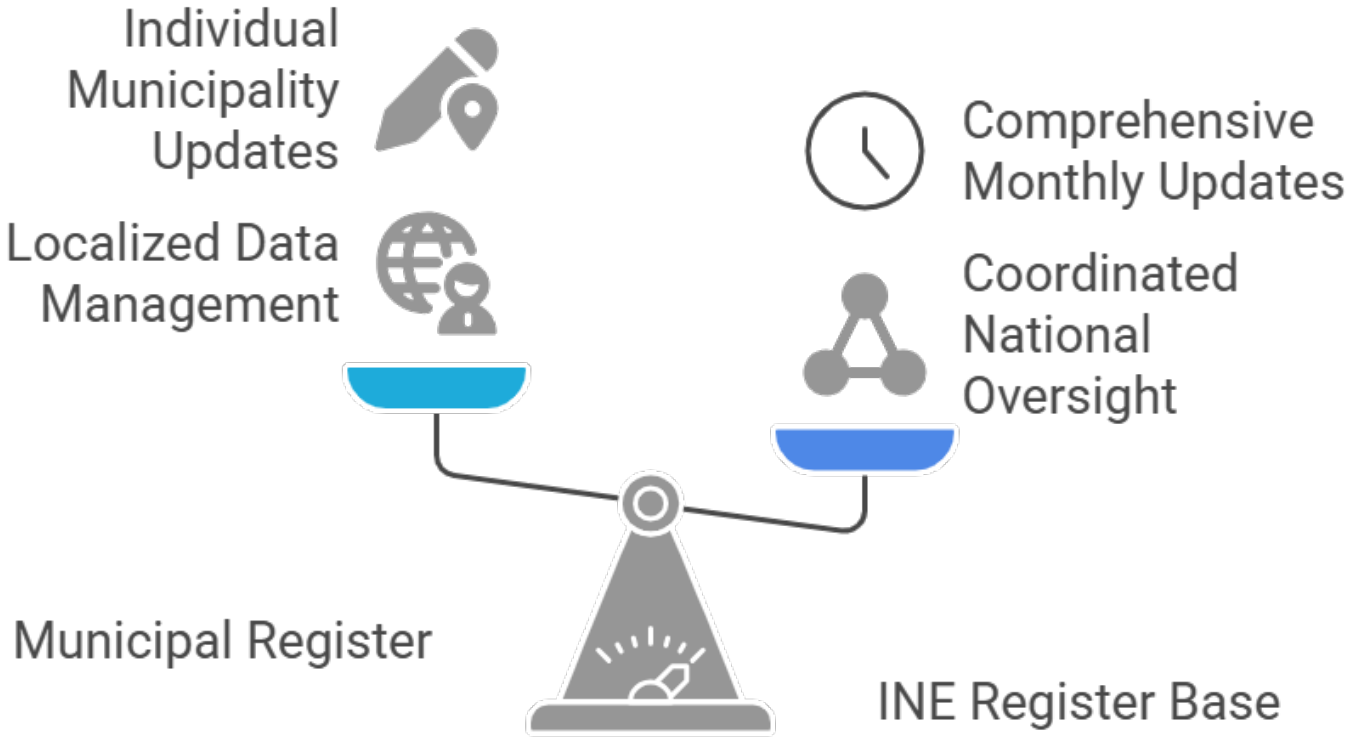
Integration of official nomenclature updates to align cadastral records with current INE standards and naming conventions

Implementation Strategy

Development of specialised tools and workflows to facilitate ongoing maintenance of INE road codes within cadastral systems

Establishment of regular update protocols to ensure continued alignment between cadastral and INE road identification systems

The 2025 initiative marks the first systematic step towards improving address-associated information within the cadastral system. This focused effort on INE road code accuracy will significantly enhance data interoperability with the National Statistics Institute and other governmental bodies, reducing errors and simplifying future maintenance processes.



Balancing Local and National Residency Data Management

Approach for data management in the Padrón project.

Separate Data Elements

Enhance data clarity and organization

Real-time Web Services

Improve data exchange efficiency

Enhancements of the Padrón Online Project

Real-Time Web Services

Immediate data access for timely insights

Territorial Information

Detailed geographic data for accurate demographics

Cadastral Reference

Linking land data to enhance spatial accuracy

Personal Information

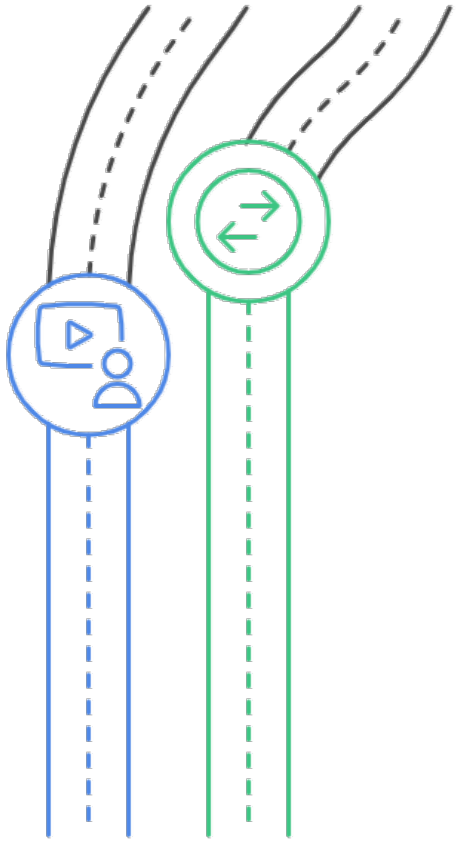
Comprehensive data on individuals for better services

Action 1

Focuses on separating municipal and individual data for improved data management.

Action 2

Enhances data exchange between municipalities and the INE for better integration.



Implementation of Padrón Online Pilot Test

Design Technical Guide

INE creates a guide for Padrón Online

Conduct Pilot Test in Municipalities

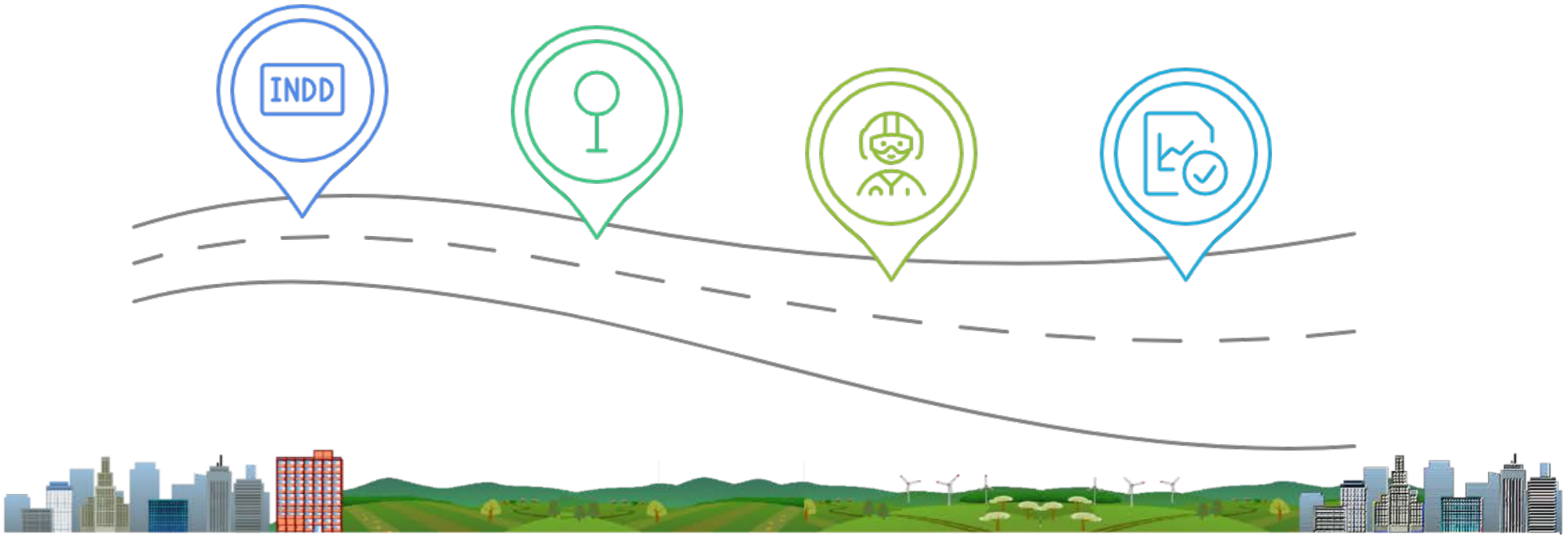
Pilot test initiated in 20 municipalities

Current Pilot with Regional Cadastres

Ongoing pilot with regional cadastres

Evaluate Municipality Readiness

Assessing municipalities' readiness for Padrón Online



Realizado

6 Provincias

17 Municipios

Amoeiro
Celanova
O Irixo
A Merca
Ourense

Galende

Rivas-
Vaciamadrid

Cártama
Estepona
Fuengirola

En curso, en las 4 provincias

Huércal-Overa
Vera
Vicar
El Ejido

Montseny
Sant Pere de Ribes
Vilafranca del Penedes

INE

Collaborative Project Administration

Local Administration

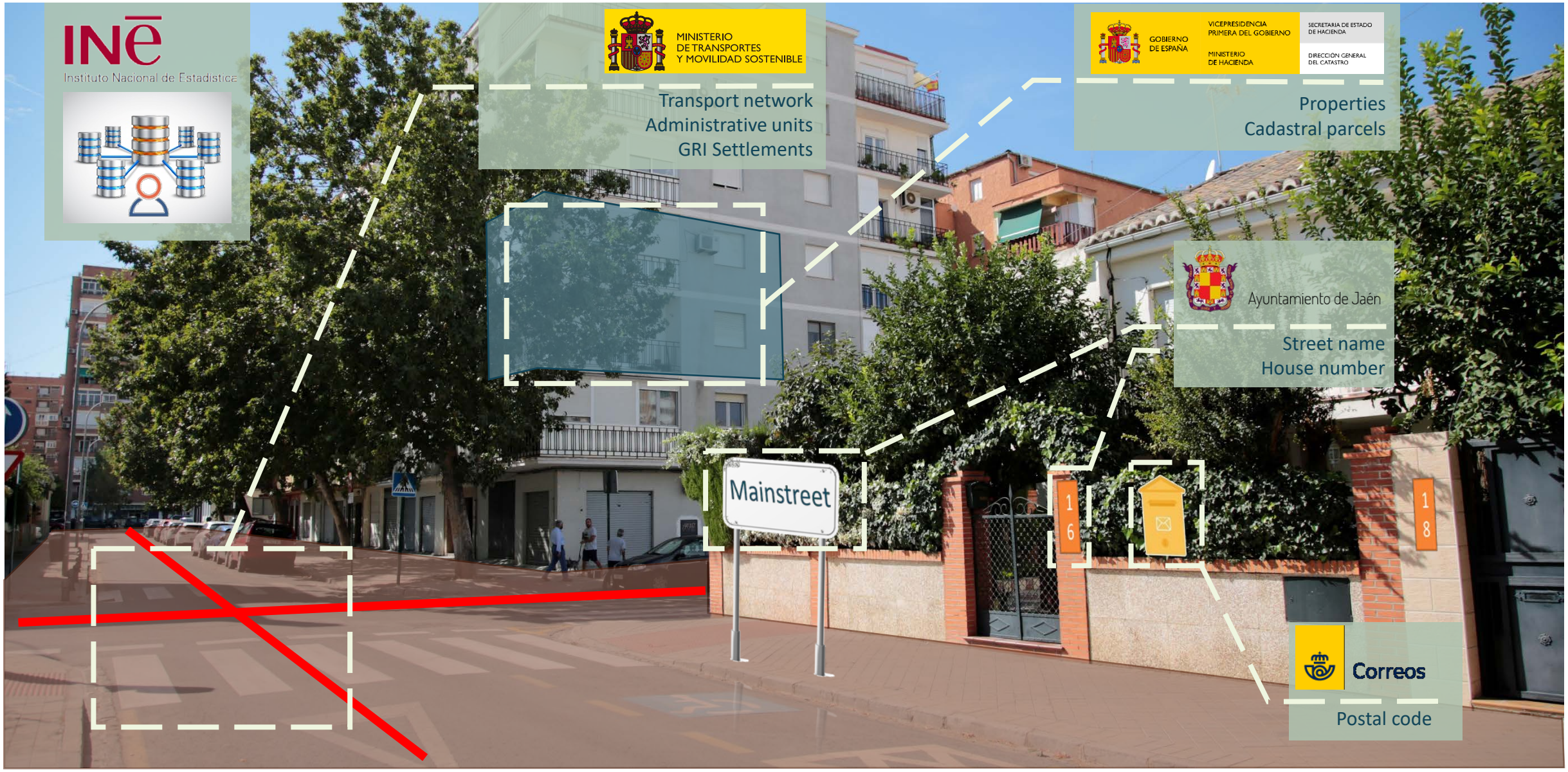
Grassroots organizations managing local affairs

General State Administration

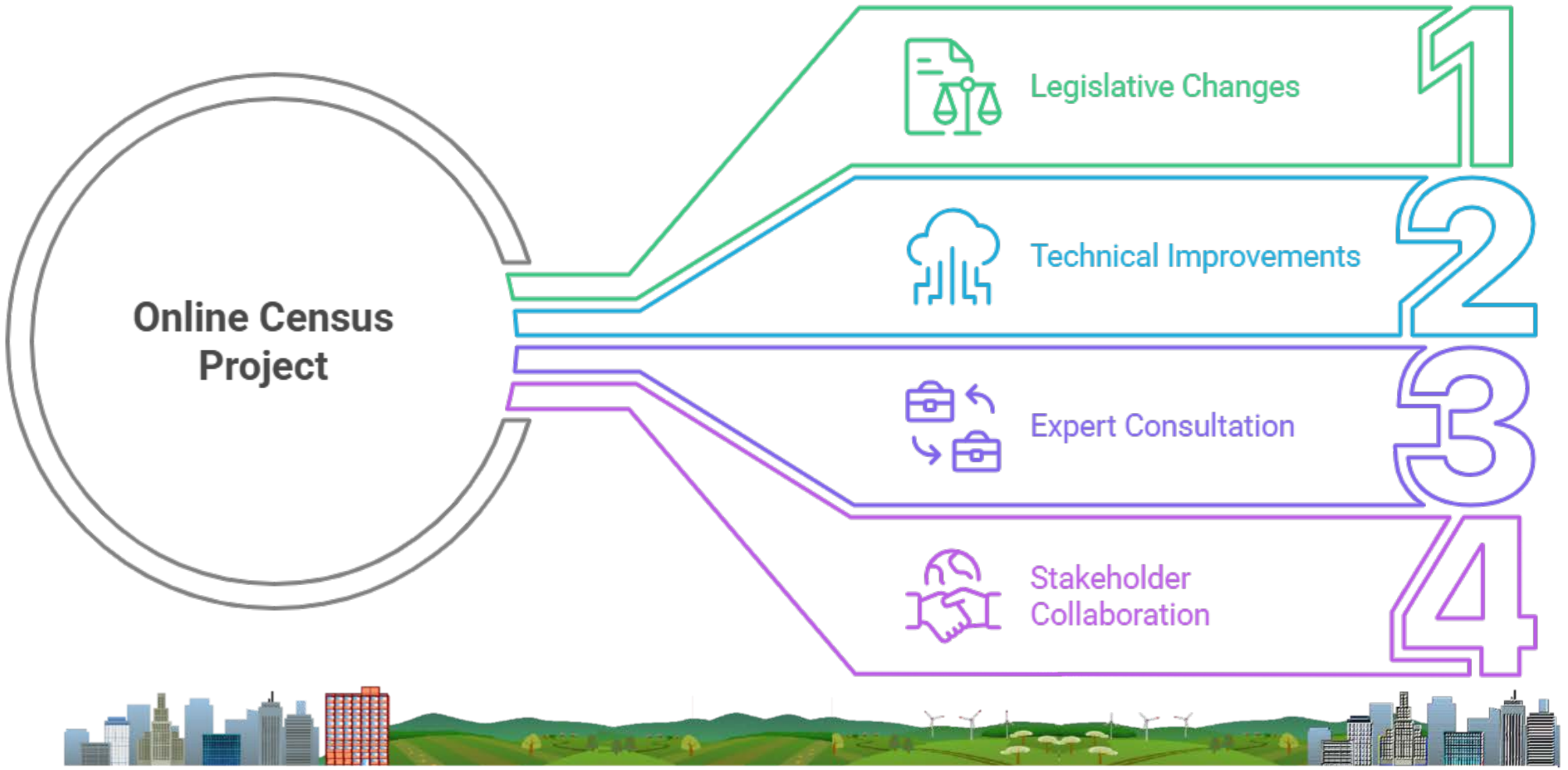
National-level agencies providing overarching support

Autonomous Communities

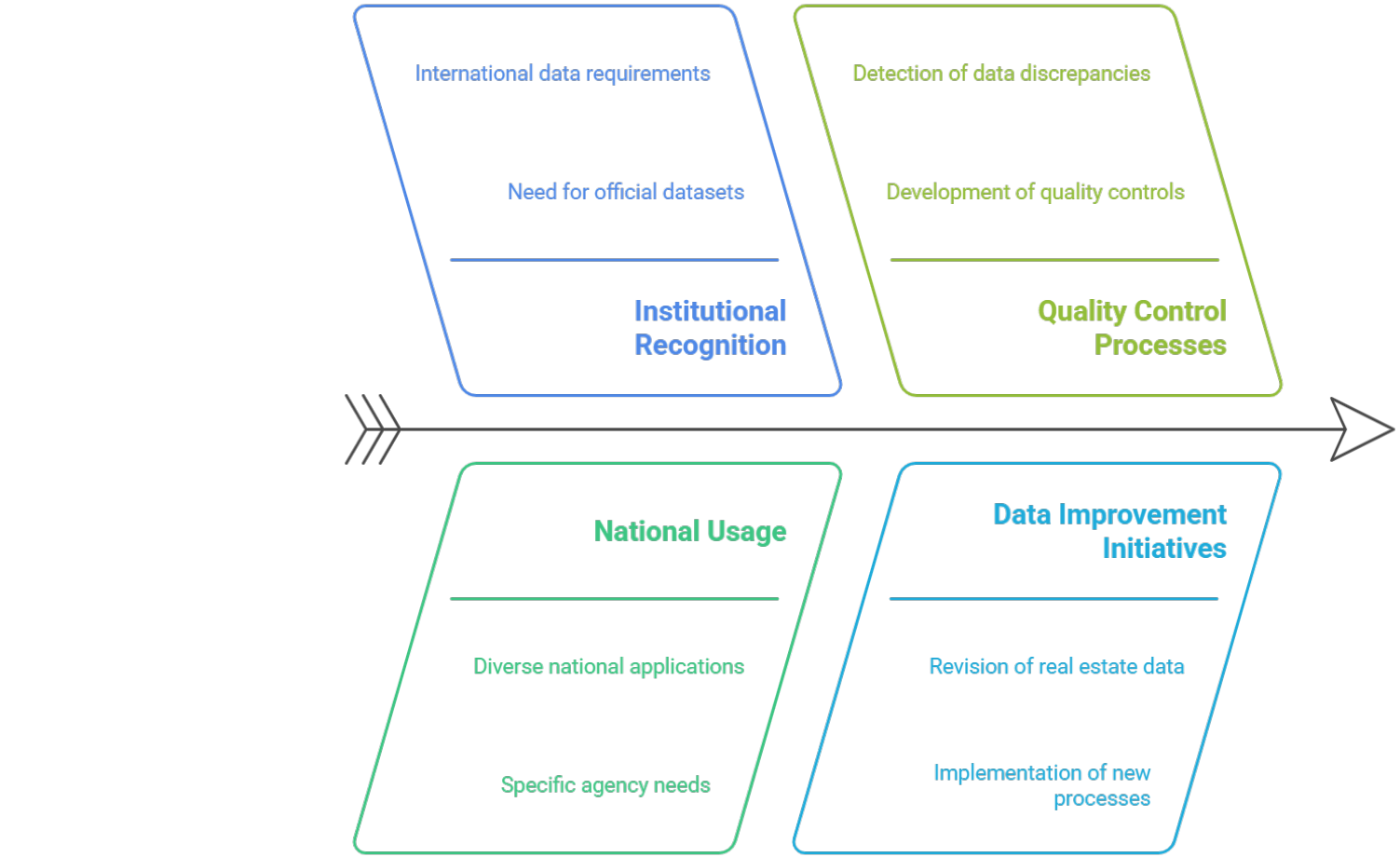
Regional entities offering specialized services


INE
Instituto Nacional de Estadística
MINISTERIO
DE TRANSPORTES
Y MOVILIDAD SOSTENIBLE
Transport network
Administrative units
GRI Settlements
GOBIERNO
DE ESPAÑA
VICEPRESIDENCIA
PRIMERA DEL GOBIERNO
MINISTERIO
DE HACIENDA
SECRETARÍA DE ESTADO
DE HACIENDA
DIRECCIÓN GENERAL
DEL CATASTRO
Properties
Cadastral parcels
Ayuntamiento de Jaén
Street name
House number
Mainstreet
16
18
Correos
Postal code

Unveiling the Online Census Project's Impact



Enhancing Georeferenced Postal Address Data Quality



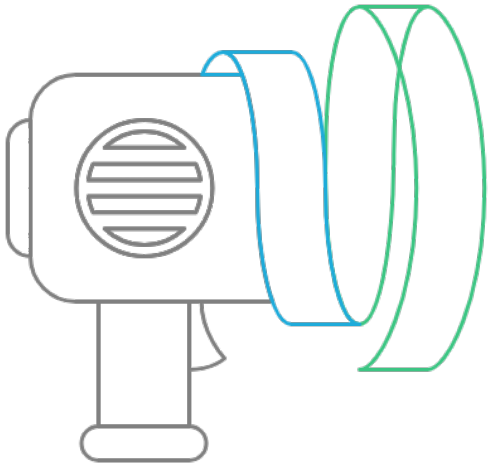
Address Analysis Process

Municipality-Level Analysis

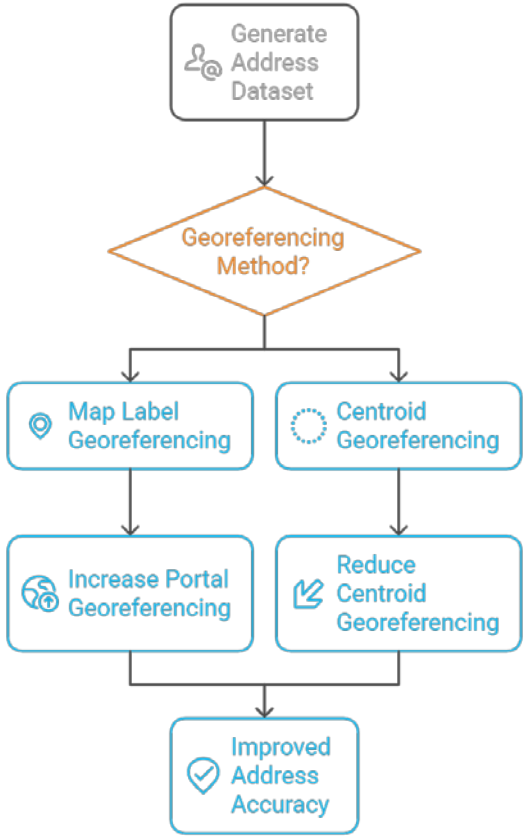
Addresses grouped by municipality

Attribute Detection

Identifying addresses with similar attributes



Improving Address Georeferencing



Unifying Street Data for Consistency and Accuracy

Maintenance of Cadastral Information

Cross-Referencing with Municipal Maps

Unifying Road Data

Addressing Duplicities in VIA Table

Improving Cadastral Database Road Codes