

CASE STUDY

Kenya Pilot Project: A Comparison of Traditional iRAP Method versus the Enhanced Method with AssetMAPPER

The Challenge

During road assessments across four major national highways in Kenya, the coding team faced a major bottleneck: manually coding 676 kilometers of road imagery to identify safety-related attributes. Using the International Road Assessment Programme's (iRAP) ViDA software alongside spreadsheets, road coders had to review every 100-meter segment, frame-by-frame. For each segment, they would watch the video, pause it, return to their spreadsheets, then manually enter values for more than 50 individual road attributes - repeating this process for the entire dataset.

According to Cliff Oketch Onyango, an iRAP Accredited Practitioner and the Kenya pilot project coordinator, "The manual process was hectic and tedious. You watch a 100-meter segment, go back, and code it. Now imagine doing this for 1,000 kilometers - it's overwhelming, exhausting and slow."

This traditional workflow created several challenges:

- **Time-Intensive:** Manually coding 676 km of roads took four coders 10 weeks, equivalent to just 17 km per week per person. A single 100 km corridor could take nearly six weeks of full-time effort for one coder.
- **Labour-Intensive:** High concentration levels for extended periods, leading to fatigue and human errors.
- **Inconsistent:** When multiple road coders are involved to perform footage review and attribute tagging, feature interpretations can vary, leading to inconsistent results.
- **Error-Prone:** Data formatting for ViDA uploads introduced risks of rework.
- **Poorly Scalable:** The manual method cannot scale efficiently for large-scale assessments, creating bottlenecks.
- **Limited Sensitivity to High Crash Locations (HCLs):** Full-section coding often misses critical hotspots, undermining targeted safety interventions.

Project Name

2024 iRAP Assessment in Kenya

Solution

AssetMAPPER Roads

Location

- Rift Valley Region (Narok & Bomet Counties) – 110.7 km
- Nyanza & Rift Valley Region (Kisii, Nyamira, Bomet, Kericho Counties) – 102.3 km
- Central Kenya – 164.8 km
- Coastal Region – 299 km

Goals

- Pilot automated road coding to reduce manual effort.
- Improve accuracy and consistency of road assessments.
- Build scalable workflows for road network assessments.

Highlights

- 676 km of road imagery coded across four major national corridors.
- With the traditional method, four road coders working six hours a day needed up to 2.5 months to complete the work.
- The enhanced method with AssetMAPPER cuts this time to just weeks, saving approximately 75% of the effort.

ROI

- Cut coding time by up to approximately 75%.
- Potential to deliver greater impact in low- and middle-income countries, with cost savings of at least 12.5%.

“The method with AssetMAPPER has transformed the way we code roads. It’s faster, more accurate, and allows us to deliver life-saving results with confidence.”

Cliff Oketch Onyango | iRAP Accredited Practitioner and Kenya Pilot Project Coordinator



These inefficiencies delayed project delivery and diverted resources from the core mission: analyzing crash risks and developing life-saving investment plans.

Breaking the Bottleneck

The coding team turned to Transoft Solutions’ AssetMAPPER Roads, a web-based platform designed to streamline the assessments. Combining computer vision, an intuitive interface, and seamless ViDA integration, workflows became faster, scalable and highly reliable. AssetMAPPER stood out as the perfect fit by combining advanced automation with user-friendly tools:

- **Automated detection** of 20 key road attributes, reducing manual effort
- **Drop-down menus** for simplified coding of additional attributes
- **Geo-referenced imagery** ensures accuracy without rechecking-frames
- **Real-time collaboration features** for distributed teams
- **Visualization, editing, and review tools** to ensure data quality before submission
- **Seamless integration** with iRAP’s ViDA platform for instant compatibility
- **Progress tracking dashboards** for supervisory oversight

Before AssetMAPPER, road assessments were manual, slow, and error-prone, delaying delivery and straining resources. With AssetMAPPER, workflows became streamlined, automated, and quality-assured, cutting months of work down to weeks while making the most out of project funding.

A comparison was performed between the traditional method vs the AssetMAPPER method for a section of road (138 km). The result showed it took 75% less time when the AssetMAPPER method was used. Projecting the results for the full 676 km project, it could have saved approximately 900 hours. This efficiency gain means the team could potentially assess a road network four times larger using the same resources.

Benefits of Using the enhanced method with AssetMAPPER

1. Efficiency and Scalability

The platform makes road coding faster, easier and more affordable, enabling large-scale assessments to be completed in a fraction of the time compared to manual methods. For example, what previously took months can now be done in weeks, helping the team meet tight project deadlines and handle large assessments without increasing coder fatigue or costs.

2. Confidence and Accuracy

With 360° video footage and AiRAP road coding, AssetMAPPER automatically detects and classifies 20 key attributes, including road markings, signs, barriers, lighting, pedestrians, cyclists, pavement defects, and curves. For attributes that are not automated, road coders can review the extracted geo-referenced imagery within the tool and use the simple drop-down menus to make manual coding easier. This precision ensures faster, more reliable coding, and easier to peer review.

Traditional iRAP Method

Enhanced Method with AssetMAPPER

3. Targeted Coding for High-Risk Areas

AssetMAPPER allows coders to move beyond blanket assessments and, instead, focus on the most dangerous road sections. By filtering 1- and 2-star segments and incorporating crash data, teams can zero in on fatal crashes, serious injuries, or property damage only (PDO) incidents. This makes it possible to prioritize the highest-risk areas, ensuring safety interventions are targeted where they will have the greatest impact.

Additionally, the geo-referenced imagery extracted from the 360° video footage makes it possible for practitioners to virtually put themselves into those high-risk spots and review the situation.

4. Impact Tracking and Continuous Improvement

With AssetMAPPER, teams can track the effects of safety countermeasures over time. The software makes it possible to compare results after one year and five years, showing how interventions reduce crashes and improve Star Ratings. This builds confidence among stakeholders by linking investments directly to measurable safety outcomes.

5. Collaboration and Consistency

AssetMAPPER's centralized platform allows multiple coders to work on the same corridor simultaneously.

Results Full Circle

The adoption of AssetMAPPER in Kenya's pilot project transformed road assessment workflows, cutting fatigue, meeting tight deadlines, and delivering earlier insights into high-risk locations. With stronger stakeholder confidence in Star Ratings and investment plans, the platform is now being positioned as a standard tool for future iRAP projects across Kenya and the region.

without duplicating effort. Standardized tagging and real-time supervision reduce errors and foster stronger collaboration between experts, coders and supervisors.

6. Better Data Quality and Reliability

Smart tagging and geo-referenced imagery ensure results are accurate, consistent across teams, and defensible in stakeholder reviews. Coders no longer have to second-guess measurements or reformat spreadsheets, which significantly reduces errors and rework.

“AssetMAPPER cut coding time by approximately 75%, reduced fatigue, and gave us confidence in consistent, accurate, and timely results. It set a new benchmark for road assessments—streamlined, reliable, and built for lasting impact.”

Cliff Oketch Onyango | iRAP Accredited Practitioner
and Kenya Pilot Project Coordinator