Final Year Project Showcase Batch 2021
Year 2025

Department: Urban & Infrastructure Engineering Programme: B.E Civil (Specialization in Urban)	
1	**Project Title** **Design and Development of Model Road for Karachi**
2	**Project Idea** To develop such a model road where traffic violations like illegal parking, encroachment, and wrong-way movement are reported through IoT and the authorities issue fines automatically without any human intervention. Thus, eliminating corruption, reducing traffic congestion and improving safety.
3	**Process** AI based smart detection of traffic violations through image processing, and electronic detection of noise and emissions through sensors.
4	**Outcome** IoT–based reporting of traffic violations and; emissions, noise and air quality.
5	**Evidence (Theoretical Basis)** In Karachi due to rapid urbanization, citizens are facing traffic safety issues such as health hazards and risk hazards. Road safety is the most important part of any city in the world because it protects citizens from different road violations. The objective of this project was to develop model road that observes violation and report it through IoT–based reporting. The data was collected by camera, analyze by python libraries such as Pandas, NumPy and YOLO and reported by cloud-based reporting. As a result of this study, different risk hazards were identified on Allama Shabbir Ahmed Usmani Road; such as emissions, noise and air quality which were prominent hazard on this road. In conclusion this project will help in the reduction of traffic violations on road and enhance road safety.
6	**Impact on Sustainability of Urban Regions or SDG-11 "Sustainable Cities and Communities"** This project has immense impact on the SDG-11 "Sustainable Cities and Communities" because it helps law enforcement agencies through IoT based auto detection of violations and issuance of fines. It also helps in the improvement of environment through cloud-based reporting of emissions and noise.
7	**Competitive Advantage or Unique Selling Proposition** The project significantly reduced the burden on the enforcement authorities, both in terms of manpower and expenditure. It also helped eliminate the age-old societal issue of corruption by auto-generation of fines for traffic violations. Thus, this project attained the SDG-11 "Sustainable Cities and Communities" in its best possible letter and spirit. The IoT based reporting of violations also enables the top-level personnel in the enforcement agencies perform real-time monitoring of law-and-order situation on any site in the city.
a	**Attainment of any SDG** (e.g. How it is achieved and why it is necessary for the region) This project attained the SDG-11 "Sustainable Cities and Communities" by improving law-and-order situation through IoT based auto detection of violations and issuance of fines. It also helped improve environment through cloud-based reporting of emissions and noise.
b	**Environmental Aspect** (e.g. carbon reduction, energy-efficient, etc.) The project also involves IoT based reporting of noise and emissions on every segment of the model road. Therefore, enabling real-time monitoring of air and noise pollution on site.
c	**Cost Reduction of Existing Product** IoT based detection and issuance of fines for violations is a fairly new idea and the cost reduction of this automatic process in comparison with manual issuance of fines is yet to be determined.

d	**Process Improvement which Leads to Superior Product or Cost Reduction, Efficiency Improvement of the Whole Process** (e.g. What is the issue is current process and what improvement you suggests) The issue in the current in-person detection of traffic violations is that it is labor intensive and involves human error. Furthermore, in-person monitoring can not be performed 24/7. The adoption of the methodology outlined in the project can help achieve this.	
e	**Expanding of Market share** (e.g. how it expand and what is the problem with the current market	
f	**Capture New Market** The market of automatic enforcement is comparatively new and the project has the capability of capturing it.	
8	**Target Market** The target market is enforcement agencies and public/private organizations that require monitoring of their space.	
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