



## Executive Summary

Rashid Minhas Road is a major arterial road located in the city of Karachi, Pakistan. The road is approximately 14 kilometers long and runs from the intersection of University Road and Jauhar Road to National Highway and Shahrah-e-Faisal, connecting the city's eastern parts to the western parts.

For Toyota Road Improvement Project, approximately 10 km segment of the arterial is selected. It starts from the Millennium Mall and ends at Nagan Chowrangi. The part of arterial considered for the study is of utmost importance due to the presence of significant landmarks. The residential, commercial, and recreational land use on significant portion of the road depicts that the vehicle mix observed in this segment consists mostly of motorcycles, cars, and pick-up vans. A small proportion of heavy vehicles due to presence of few factories in the area.

Various data collection methods were employed to identify the road defects and arising road safety concerns on the Rashid Minhas Road. These included travel time surveys, traffic count surveys, drone surveys, road inventory surveys, and collecting accident data from the Sindh traffic police and RTIPC. The free flow travel time observed on the arterial ranges between 12.5 minutes through survey. Furthermore, it also provided the critical points where significant traffic congestion was observed which includes the segments present on Millennium Mall, Imtiaz Mega Market, and Lucky One Mall. It depicts that the traffic generated for these markets and mall is creating a contributing factor for congestion on the arterial. The primary objectives of the traffic count survey were to determine the current traffic volume of through traffic on the selected road segment. For this purpose, four locations were selected for traffic video count survey, including Millennium Mall, Aladdin Park, Shafiq Morr, and Dayar-e-Shereen. The maximum volume for both directions was obtained at Shafiq Morr.

A drone survey was conducted for data collection that is used to gather information on traffic conditions using a Drone Camera. The survey was conducted on 8th, 9th, 13th and 17th March 2023. The Pix4D application was used to perform flight scheduling for the survey. Compared to Google Earth, the drone survey method was more effective in identifying road defects such as pothole width, encroached land, illegal onside parking, and also provides a better understanding of the area's topography.



Problems including Pothole/Ditch, wrong-way movements, debris, and encroachment have been identified by going onsite and by using drone images as well. An open Nala has been observed near Dayar-e-Shereen Gujjar Nala, which is too dangerous for the residents as well as the road users. A significant amount of wrong-way movements are generated on the U-turn beneath the Nepa flyover. Sand debris is observed near Lucky One Mall on the fast lane. Parking and encroachment have been observed near Millennium Mall, Chase Value Supermarket in front of Aladdin Park, Imtiaz Mega Mall near Orangi Nala, and in front of Lucky One Mall. The entire data was used to perform traffic modelling for evaluating existing travel time which was obtained as 19.45 minutes from Drigh road to Nagan chowrangi while 19.4 minute for opposite direction. After conducting a detailed analysis, we evaluated the road defects and proposed solutions for both geometric and traffic improvements to reduce existing travel time delays.

One of the significant issues that was observed on the arterial was traffic congestion near the malls. It has been deduced that this congestion was primarily due to the design of existing u-turns and intersections on the road. Therefore, such u-turns must be provided with proper channelization, provision of island, and adequate length for weaving and merging movements to ensure smooth flow of traffic. One suggestion is also provided for the Millennium mall intersection that is to provide roundabout for reducing the conflicting points.

The traffic problem on Rashid Minhas Road is a pressing issue that requires immediate attention. The rise in traffic volume, land encroachments, on-street parking, geometric design defects, and lack of effective traffic management measures have led to significant traffic congestion and safety concerns for all road users. Furthermore, some comprehensive solutions are required to address these issues, which involves implementing various measures such as amending existing road facilities, modifying existing intersections, installing traffic signals, and removing encroachments. By implementing these measures, it is possible to alleviate the traffic problem on Rashid Minhas and improve the safety and efficiency of this critical arterial road that connects Shahrah-e-Faisal with University Road and Shahrah-e-Usman.

**Table 1 Problems at Critical Locations and their solutions**

LOCATIONS	COORDINATES	PROBLEMS IDENTIFIED	SOLUTIONS PROPOSED
Millenium Mall	24.900701°, 67.116212°	<ul style="list-style-type: none"> <li>•encroachment</li> <li>•illegal parking</li> <li>•improper bus stops</li> <li>•congestion</li> </ul>	<ul style="list-style-type: none"> <li>• Police challan and enforcement</li> <li>•Designated parking places</li> <li>•Regulation of proper bus stops for public transport</li> </ul>
Aladdin U-turn	24.909413°, 67.107989°	<ul style="list-style-type: none"> <li>•encroachment</li> <li>•Wednesday, Thursday market parking on -road</li> <li>•wrong way movements</li> </ul>	<ul style="list-style-type: none"> <li>• Police challan and enforcement</li> <li>•Designated parking places</li> <li>•Relocate the u-turn</li> </ul>
English Learning Institutes	24.921039°, 67.094115°	<ul style="list-style-type: none"> <li>•damaged roadway</li> <li>•potholes, ditches</li> <li>•on-road parking</li> </ul>	<ul style="list-style-type: none"> <li>•surfacing and filling of potholes</li> <li>•Provide parking spaces</li> </ul>
Moti Mehal U-turn and Imtiaz Mega	24.926418°, 67.089862°	<ul style="list-style-type: none"> <li>•on-road parking</li> <li>•congestion</li> <li>•encroachment</li> </ul>	<ul style="list-style-type: none"> <li>• Police challan and enforcement</li> <li>•Designated parking places specially for Imtiaz Mega</li> </ul>
Lucky One Mall	24.9323574°, 67.0846889°	<ul style="list-style-type: none"> <li>• No road crossing facilities for pedestrians</li> </ul>	<ul style="list-style-type: none"> <li>• Provision of traffic calming devices and Pedestrian Bridge</li> </ul>
Gujjar Nala	24.957738°, 67.075669°	<ul style="list-style-type: none"> <li>•open walls of nala on some points</li> </ul>	<ul style="list-style-type: none"> <li>•proper wall construction all along the nala to protect road users</li> </ul>