

Design & Feasibility Study

Importance of Ring Roads and Bypass roads

▪ Importance of Ring Roads and Bypass Roads Outside Urban Areas

Ring roads and Bypass roads outside urban areas represent key elements of modern transportation infrastructure. Their implementation is essential for improving mobility, enhancing road safety, and supporting sustainable economic growth. In feasibility studies and highway design projects, these facilities are considered strategic investments that increase the efficiency and resilience of the transportation network.

▪ Traffic Operations and Network Performance

The primary function of ring roads is to divert through traffic and long-distance trips away from urban centers. This reduces traffic congestion, improves travel time reliability, and enhances the level of service on both urban and interurban road networks. Grade-separated interchanges further improve traffic operations by eliminating conflicts at intersections and providing uninterrupted traffic flow.

▪ Importance for Freight Transportation

From a freight transportation perspective, outer ring roads and Bypass roads are of particular importance. Heavy trucks and commercial vehicles require high-capacity facilities capable of accommodating large traffic volumes and ensuring efficient movement between industrial areas, logistics centers, ports, and national highways. By routing freight traffic outside urban areas, these facilities reduce travel delays, decrease fuel consumption, lower vehicle operating costs, and improve supply chain reliability. In addition, separating heavy vehicles from local traffic contributes to enhanced road safety and minimizes pavement deterioration within urban areas.

▪ Economic Benefits

Efficient transportation corridors contribute significantly to regional and national economic development. Ring roads and Bypass roads improve accessibility, facilitate the movement of goods and services, and support commercial and industrial activities. These benefits result in reduced transportation costs and increased economic competitiveness.

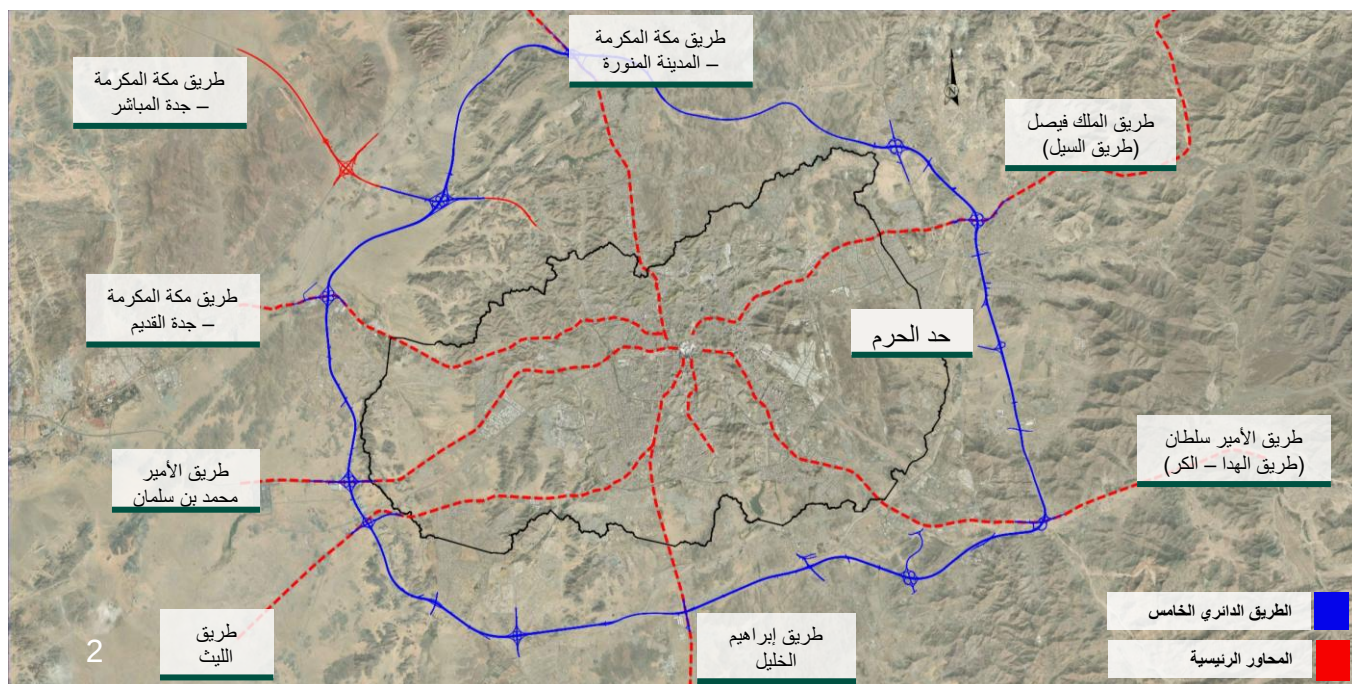
▪ Environmental and Social Benefits

The diversion of through traffic away from densely populated areas contributes to reducing air pollution, traffic noise, and greenhouse gas emissions. Moreover, improved traffic flow enhances the quality of life for residents and supports sustainable urban development.

Projects Example

Study and design of Fifth Ring Road (Makkah Almukaramah)

North-eastern Bypass for Riyadh City



عدد المسارات للطريق الرئيسي

04 مسارات اتجاه



السرعة التصميمية

140 كم/ساعة



طول الطريق

134 كم



معايير السيارات

01 معبر



الدورانات للخلف

03 دورانات



عدد الجسرات والحفر الاستكشافية

507 جسة



عدد الجسور

130 جسر



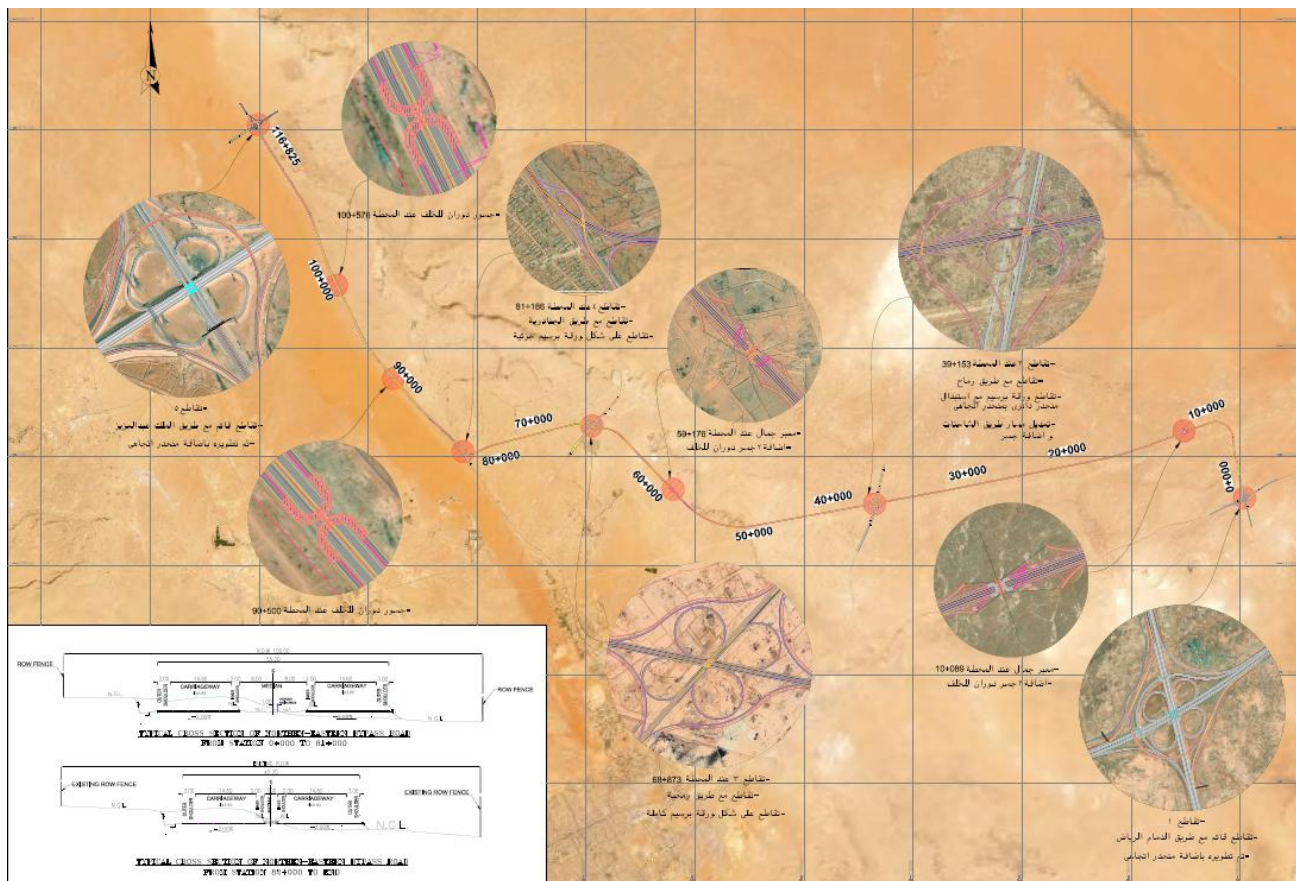
طول الطرق الفرعية

220 كم



طرق الخدمة للاتجاه عند الحاجة

03 مسارات اتجاه



مساحات الرفع الطبوغرافي

70 مليون متر مربع

ساعات فريق العمل

260 ألف ساعة

المخططات والتقارير

33+ ألف تقرير



تقارير المتابعة والأداء

100 تقرير

مواقع الرفع المساحي الراداري

250 موقع

جهات تم التنسيق معها

21 جهة



التكلفة التقديرية للمشروع

15 مليار ريال سعودي

مواقع الحصر المروري

172 موقع

ورش عمل

175 ورشة

Conclusion

In highway design and feasibility studies, ring roads and grade-separated interchanges outside urban areas are considered essential components of an integrated transportation system. Their role in improving traffic efficiency, supporting freight transportation, enhancing road safety, and promoting economic development justifies their inclusion as strategic infrastructure investments capable of meeting current and future transportation demands.

Biography - Eng. Mohamed Refaie

Head of Transportation Department

M.Sc. in Highway & Airport Engineering, Cairo University, Egypt 2001 – B.Sc. In Civil Engineering, Cairo University, Egypt A highly accomplished Roads & Highways Design Director with over 23 years of specialized experience in the planning, geometric design, pavement engineering, and rehabilitation of major highways, expressways urban road networks, and complex interchanges across Saudi Arabia, UAE, Bahrain, Jordan, and Egypt Demonstrated expertise in delivering full-cycle design services—from concept development and feasibility studies to detailed design, tender documentation, and construction support. Proven capability in leading multidisciplinary teams covering highway design, surveying, hydrology, soil investigations, and geotechnical studies, ensuring compliance with international and regional standards including AASHTO, ASTM, MOT (KSA), RTA (UAE), Dubai Municipality Manual, Egyptian Code, DMRB, and Bahrain Roads & Bridges Manual.

