



## ROUTE NUMBERING SYSTEM POLICY AND PROCEDURES

(TR-538)

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GOVERNMENT OF ABU DHABI



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## GLOSSARY

Specialized terms, abbreviations and acronyms frequently used in this manual are listed and defined below. Where a term, abbreviation or acronym is defined in another Department of Transport Manual, that definition is applied to this manual by reference.

**Abu Dhabi Route** or **AD-route** - an intra-Emirate primary arterial, expressway or freeway connecting cities, communities or particular areas (rural, industrial, or urban) with other AD-routes or Emirates routes, as well as major routes within urban and suburban areas.

**Advisory Speed** - a recommended speed for all vehicles operating on a section of road and based on the road design, operating characteristics, and conditions.

**Arterial Road (Street)** - a general term denoting a road primarily used by through traffic, usually on a continuous route or a road designated as part of an arterial system.

**Average Annual Daily Traffic (AADT)** - the total volume of traffic passing a point or segment of a road facility in both directions for one year divided by the number of days in the year. Normally, periodic daily traffic volumes are adjusted for hours of the day counted, days of the week, and seasons of the year to arrive at average annual daily traffic.

**Average Daily Traffic (ADT)** - the average 24 hour volume, being the total volume during a stated period divided by the number of days in that period. Normally, this would be periodic daily traffic volumes over several days, not adjusted for days of the week or seasons of the year.

**Average Day** - a day representing traffic volumes normally and repeatedly found at a location, typically a weekday when volumes are influenced by employment or a weekend day when volumes are influenced by entertainment or recreation.

**Barrier-Separated Lane** - a preferential lane or other special purpose lane that is separated from the adjacent general-purpose lane(s) by a physical barrier.

**Carriageway** - refers to the configuration of a road. A **single-carriageway** road involves a single roadway which either carries a single direction of traffic (typically found in urban areas) or two directions of traffic, with each direction separated by specific longitudinal markings in the middle section of the roadway. A single –carriageway road may have one or more lanes of traffic in each direction, and may contain specific left turn lanes at intersections, or a two-way left turn lane, again channelized using pavement markings. A **Dual-Carriageway** road involves two sets of paved roadways, each serving traffic travelling in the opposite direction of the other, separated by a physical barrier (i.e., a median or concrete barrier).

**Collector Road** - a term denoting a road that in rural areas connects small towns and local highways to arterial highways, and in urban areas provides land access and traffic circulation within residential, commercial, and business areas and connects local highways to the arterial highways.

**Concurrent Flow Preferential Lane** - a preferential lane that is operated in the same direction as the adjacent mixed flow lanes, separated from the adjacent general-purpose freeway lanes by a standard lane stripe, painted buffer, or barrier.

**Cutout Emblem** (see “Emblem” below) - Refers to route number symbols that are directly cut out along the outer shape of the emblem and placed directly on a sign post or more commonly, on a guide sign.

**Downstream** - a term that refers to a location that is encountered by traffic subsequent to an upstream location as it flows in an “upstream to downstream” direction. For example, “the downstream end of a lane line separating the turn lane from a through lane on the approach to an intersection” is the end of the lane line that is closest to the intersection.

**Emblem or Route Emblem** (also called **Shield**) - refers to the unique symbol identifying a particular type of route (E-route, AD-route), which contains the route number within the symbol design. The symbol is to be a unique shape or colour which distinguishes the specific route types from each other. It may be surrounded by a solid colour background in order to distinguish its shape, and thus permit the route sign to be of square or rectangular shape. If a light coloured emblem is used, and needs to be placed on a guide sign, the emblem may be configured as a “cutout” emblem whose shape and colour contrasts with the background colour of the sign itself.

**Emirates Route or E-route** - a high-speed road with limited or controlled access connecting multiple Emirates or connecting a major city within an Emirate with international border crossings

**End-of-Roadway Marker** - a device used to warn and alert road users of the end of a roadway in other than temporary traffic control zones.

**Engineering Judgment** - the evaluation of available pertinent information, and the application of appropriate principles, provisions, and practices as contained in this Manual and other sources, for the purpose of deciding upon the applicability, design, operation, or installation of a traffic control device. Engineering judgment shall be exercised by an engineer, or by an individual working under the supervision of an engineer, through the application of procedures and criteria established by the engineer. Documentation of engineering judgment is not required.

**Engineering Study** - the comprehensive analysis and evaluation of available pertinent information, and the application of appropriate principles, provisions, and practices as contained in this Manual and other sources, for the purpose of deciding upon the applicability, design, operation, or installation of a traffic control device. An engineering study shall be performed by an engineer, or by an individual working under the supervision of an engineer, through the application of procedures and criteria established by the engineer. An engineering study shall be documented.

**Expressway** - a dual-carriageway road with partial control of access.

**Freeway** - a dual-carriageway road with full control of access. May also be called a **Motorway**.

**Grade Crossing** - the general area where a road and a railroad and/or light rail transit route cross at the same level, within which are included the tracks, road, and traffic control devices for traffic traversing that area.

**Guide Sign** - a sign that shows route designations, destinations, directions, distances, services, points of interest, or other geographical, recreational, or cultural information.

**Interchange** - a system of interconnecting roadways providing for traffic movement between two or more freeways, expressways, or other roads that do not intersect at grade.

**Intermediate Interchange** - an interchange with an urban or rural route that is not a major or minor interchange as defined in this Section.

**Intersection** - intersection is defined as follows:

1. The area embraced within the prolongation or connection of the lateral curb lines, or if none, the lateral outer boundary lines of the two roads that join one another at, or approximately at, right angles, or the area within which vehicles travelling on different roads that join at any other angle might come into conflict.
2. The junction of an alley or driveway with a road shall not constitute an intersection, unless the road at said junction is controlled by a traffic control device.
3. If a road includes dual carriageways, each of which are 10 m or more apart (see definition of Median), then every crossing of each roadway of such a dual-carriageway road by an intersecting road shall be a separate intersection.
4. If both intersecting highways include dual carriageway roads whereas each roadway is 10 m or more apart, then every crossing of any two roadways of such roads shall be a separate intersection.
5. At a location controlled by a traffic control signal, regardless of the distance between the separate intersections as defined in (c) and (d) above:
  - a. If a stop line, yield line, or crosswalk has not been designated on the roadway (within the median) between the separate intersections, the two intersections and the roadway (median) between them shall be considered as one intersection;
  - b. Where a stop line, yield line, or crosswalk is designated on the roadway on the intersection approach, the area within the crosswalk and/or beyond the designated stop line or yield line shall be part of the intersection; and
  - c. Where a crosswalk is designated on a roadway on the departure from the intersection, the intersection shall include the area extending to the far side of such crosswalk.

**Kilometre Post** - refers to a location marker mounted at locations corresponding to the number of kilometres from the southernmost or westernmost point on the road or from a DoT-designated origin. It will typically contain a route number display with the kilometre posting placed below in a vertical fashion (i.e., numeric digits are placed one above the other).

**Legend** - see Sign Legend.

**Logo** - a distinctive emblem or trademark that identifies a commercial business and/or the product or service offered by the business.

**Major Interchange** - an interchange with another freeway or expressway, or an interchange with a high-volume multi-lane highway, principal urban arterial, or major rural route where the interchanging traffic is heavy or includes many road users unfamiliar with the area.

**Major Street** - the street normally carrying the higher volume of vehicular traffic.

**Managed Lane** - a road lane or set of lanes, or a road facility, typically a freeway, for which variable operational strategies such as direction of travel, tolling (see Open Road Tolling below), pricing (see Congestion Pricing), and/or vehicle type or occupancy requirements are implemented and managed in real-time in response to changing conditions. Managed lanes are typically buffer- or barrier-separated lanes parallel to the general-purpose lanes of a road in which access is

restricted to designated locations. There are also some roads for which all lanes may be considered as managed.

**Median** - the area between the two carriageways of a dual-carriageway road, measured from edge of travelled way to edge of travelled way. The median excludes turn lanes. The median width might be different between intersections, interchanges, and at opposite approaches of the same intersection.

**Minor Interchange** - an interchange where traffic is local and very light, such as interchanges with land service access roads. Where the sum of the exit volumes is estimated to be lower than 100 vehicles per day in the design year, the interchange is classified as local.

**Minor Street** - the street normally carrying the lower volume of vehicular traffic.

**Multi-Lane** - more than one lane moving in the same direction. A multi-lane street, highway, or roadway has a basic cross-section comprised of two or more through lanes in one or both directions. A multi-lane approach has two or more lanes moving toward the intersection, including turning lanes.

**Object Marker** - a device used to mark obstructions within or adjacent to the roadway.

**Opposing Traffic** - vehicles that are travelling in the opposite direction. At an intersection, vehicles entering from an approach that is approximately straight ahead would be considered to be opposing traffic, but vehicles entering from approaches on the left or right would not be considered to be opposing traffic.

**Overhead Sign** - a sign that is placed such that a portion or the entirety of the sign or its support is directly above the roadway or shoulder such that vehicles travel below it. Typical installations include signs placed on cantilever arms that extend over the roadway or shoulder, on sign support structures that span the entire width of the pavement, on mast arms or span wires that also support traffic control signals, and on road bridges that cross over the roadway.

**Passive Grade Crossing** - a grade crossing where none of the automatic traffic control devices associated with an Active Grade Crossing Warning System are present and at which the traffic control devices consist entirely of signs and/or markings.

**Pathway Grade Crossing** - the general area where a pathway and railroad or light rail transit tracks cross at the same level, within which are included the tracks, pathway, and traffic control devices for pathway traffic traversing that area.

**Posted Speed Limit** - a speed limit determined by law or regulation and displayed on Speed Limit signs.

**Priority Control** - a means by which the assignment of right-of-way is obtained or modified.

**Private Road** - roads that are privately owned and operated, and not open to the public without express permission of the owner. These may include roads within private gated properties (except for toll roads) where access is restricted at all times, parking areas, driving aisles within parking areas, and private grade crossings.

**Public Road** - any road, street, or similar facility under the jurisdiction of and maintained by a public agency and open to public travel.

**Retroreflectivity** - a property of a surface that allows a large portion of the light coming from a point source to be returned directly back to a point near its origin.

**Road** - a general term for denoting a public way for purposes of vehicular travel, including the entire area within the right-of-way, that is improved, designed, or ordinarily used for vehicular travel and parking lanes, but exclusive of the sidewalk, berm, or shoulder even though such sidewalk, berm, or shoulder is used by persons riding bicycles or other human-powered vehicles. A road may be classified as single-carriageway or dual-carriageway (see **Carriageway** definition above).

**Road-Light Rail Transit Grade Crossing** - the general area where a road and a light rail transit route cross at the same level, within which are included the light rail transit tracks, highway, and traffic control devices for traffic traversing that area.

**Road-Rail Grade Crossing** - the general area where a road and a railroad cross at the same level, within which are included the railroad tracks, highway, and traffic control devices for road traffic traversing that area.

**Road Traffic Signal** - a power-operated traffic control device by which traffic is warned or directed to take some specific action. These devices do not include power-operated signs, steadily-illuminated pavement markers, warning lights, or steady burning electric lamps.

**Road User** - a vehicle operator, bicyclist, or pedestrian, including persons with disabilities, within the road or on a private road open to public travel.

**Road Network** - a geographical arrangement of intersecting roads.

**Roadway** - denotes the physical road, see also Carriageway.

**Roundabout** - a circular intersection with yield control at entry, which permits a vehicle on the circulatory roadway to proceed, and with deflection of the approaching vehicle counter-clockwise around a central island.

**Rumble Strip** - a series of intermittent, narrow, transverse areas of rough-textured, slightly raised, or depressed road surface that extend across the travel lane to alert road users to unusual traffic conditions or are located along the shoulder, along the roadway centre line, or within islands formed by pavement markings to alert road users that they are leaving the travel lanes.

**Rural Road** - a type of roadway normally characterized by lower volumes, higher speeds, fewer turning conflicts, and less conflict with pedestrians.

**Shared Roadway** - a roadway that is officially designated and marked as a bicycle route, but which is open to motor vehicle travel and upon which no bicycle lane is designated.

**Sign** - any traffic control device that is intended to communicate specific information to road users through a word, symbol, and/or arrow legend. Signs do not include road traffic signals, pavement markings, delineators, or channelization devices.

**Sign Assembly** - a group of signs, located on the same support(s), that supplement one another in conveying information to road users.

**Sign Illumination** - either internal or external lighting that shows similar colour by day or night. Street or road lighting shall not be considered as meeting this definition.

**Sign Legend** - all word messages, logos, pictographs, and symbol and arrow designs that are intended to convey specific meanings. The border, if any, on a sign is not considered to be a part of the legend.

**Sign Panel** - a separate panel or piece of material containing a word, symbol, and/or arrow legend that is affixed to the face of a sign.

**Signing** - individual signs or a group of signs, not necessarily on the same support(s), that supplement one another in conveying information to road users.

**Special Purpose Road** - a low-volume, low-speed road that serves recreational areas or resource development activities.

**Speed** - speed is defined based on the following classifications:

1. **Average Speed** - the summation of the instantaneous or spot-measured speeds at a specific location of vehicles divided by the number of vehicles observed.
2. **Design Speed**—a selected speed used to determine the various geometric design features of a roadway.
3. **85th-Percentile Speed**—the speed at or below which 85 percent of the motor vehicles travel.
4. **Operating Speed**—a speed at which a typical vehicle or the overall traffic operates. Operating speed might be defined with speed values such as the average, pace, or 85th-percentile speeds.
5. **Pace** - the 10 km/h speed range representing the speeds of the largest percentage of vehicles in the traffic stream.

**Speed Limit** - the maximum (or minimum) speed applicable to a section of road as established by law or regulation.

**Statutory Speed Limit** - a speed limit established by legislative action that typically is applicable for a particular class of highways with specified design, functional, jurisdictional and/or location characteristics and that is not necessarily displayed on Speed Limit signs.

**Street** - see Road.

**Symbol** - the approved design of a pictorial representation of a specific traffic control message for signs, pavement markings, traffic control signals, or other traffic control devices, as shown in the MUTCD.

**Toll Road** - denotes a specific road which requires its users to pay a toll or fee in order to use it, typically through electronic payment collection means using toll gates/toll gantries/toll points as described above.

**Traffic** - pedestrians, bicyclists, ridden or herded animals, vehicles, streetcars, and other conveyances either singularly or together while using for purposes of travel any road or private road open to public travel.

**Traffic Control Device** - a sign, signal, marking, or other device used to regulate, warn, or guide traffic, placed on, over, or adjacent to a street, highway, private road open to public travel, pedestrian facility, or shared-use path by authority of a public agency or official having jurisdiction, or, in the case of a private road open to public travel, by authority of the private owner or private official having jurisdiction.



**Traffic Control Signal (Traffic Signal)\*** - any road traffic signal by which traffic is alternately directed to stop and permitted to proceed.

**Train** - one or more locomotives coupled, with or without cars, that operates on rails or tracks and to which all other traffic must yield the right-of-way by law at highway-rail grade crossings.

**Travelled Way** - the portion of the roadway for the movement of vehicles, exclusive of the shoulders, berms, sidewalks, and parking lanes.

**Turn Bay** - a lane for the exclusive use of turning vehicles that is formed on the approach to the location where the turn is to be made. In most cases where turn bays are provided, drivers who desire to turn must move out of a through lane into the newly formed turn bay in order to turn. A through lane that becomes a turn lane is considered to be a dropped lane rather than a turn bay.

**Upstream** - a term that refers to a location that is encountered by traffic prior to a downstream location as it flows in an “upstream to downstream” direction. For example, “the upstream end of a lane line separating the turn lane from a through lane on the approach to an intersection” is the end of the line that is furthest from the intersection.

**Urban Street** - a type of street normally characterized by relatively low speeds, wide ranges of traffic volumes, narrower lanes, frequent intersections and driveways, significant pedestrian traffic, and more businesses and houses.

**Vehicle** - every device in, upon, or by which any person or property can be transported or drawn upon a highway, except trains and light rail transit operating in exclusive or semi-exclusive alignments. Light rail transit equipment operating in a mixed-use alignment, to which other traffic is not required to yield the right-of-way by law, is a vehicle.

**Warning Sign** - a sign that gives notice to road users of a situation that might not be readily apparent.

## ACRONYMS AND ABBREVIATIONS

The following acronyms and abbreviations, when used in this manual, shall have the following meanings. Note that acronyms followed by an asterisk are discussed in the Abu Dhabi Traffic Signals and Electronic Information and Warning Systems Manual.

**AADT** - annual average daily traffic

**AASHTO** - American Association of State Road and Transportation Officials

**AD** - Abu Dhabi (used typically in conjunction with AD-route, the intra-Emirate route numbering scheme within the Emirate)

**ADT** - average daily traffic

**AFAD** - Automated Flagger Assistance Device

**ANSI** - American National Standards Institute

**CEN** - European Committee for Standardization

**CM** - centimetres

**dBA** - A-weighted decibels

**DMA** - Abu Dhabi Department of Municipal Affairs

**DMS** - dynamic message sign

**DoT** - Abu Dhabi Department of Transport

**EPA** - Environmental Protection Agency

**ETC** - electronic toll collection

**EV** - electric vehicle

**FTA** - Federal Transport Authority of the UAE

**FHWA** - U.S. Federal Highway Administration

**GCC** - Gulf Coordination Council

**HOV** - high-occupancy vehicle

**ILEV** - inherently low emission vehicle

**ISEA** - International Safety Equipment Association

**ISO** - International Standards Organization

**ITE** - Institute of Transportation Engineers

**ITS** - intelligent transportation systems

**Km** - kilometre(s)

**km/h or kph** - kilometres per hour

**KSA** - Kingdom of Saudi Arabia

**LED** - light emitting diode

**LP** - liquid petroleum

**M** - meter(s)

**Mm** - millimetre(s)

**MoI** - UAE Ministry of the Interior

**MoPW** - UAE Ministry of Public Works (Ashghal)

**MUTCD** - Manual of Uniform Traffic Control Devices

**NCHRP** - U.S. National Cooperative Road Research Program

**ORT** - Open-Road Tolling

**PDMS** - Portable Dynamic Message Sign

**PRT** - Perception-Response Time

**RNZ** – Route Numbering Zone

**RPM** - Raised Pavement Marker

**RRPM** - Raised Retroreflective Pavement Marker

**RTA** - Dubai Roads and Transport Authority

**RV** - Recreational Vehicle

**TDD** - Telecommunication Devices for the Deaf

**TRB** - U.S. Transportation Research Board

**TTC** - Temporary Traffic Control

**UAE** - United Arab Emirates

**U.S.** - United States

**USDOT** - United States Department of Transportation

**VC** - Vehicle Code

**VPH or vph** - vehicles per hour

# 1 INTRODUCTION

## 1.1 Overview

2017 the Department of Transport (DOT) commenced with the update as well as roll out of the “Unifying and Standardizing of Road Engineering Practices” Project. The objective of the project was to enhance management, planning, design, construction, maintenance and operations of all roads and road related infrastructure in the Emirate.

To achieve this objective a set of standards, specifications, guidelines and manuals were developed in consultation with the relevant authorities. It is anticipated that all road and road related infrastructure authorities or agencies in the Emirate shall adhere to these standards, specifications and recommendations. It is also recognized that there are already published documents with similar objectives and contents prepared by other authorities and these publications have been referenced in this document.

## 1.2 Purpose and Scope

In 2017 the Department of Transport (DOT) commenced with the update as well as roll out of the “Unifying and Standardizing of Road Engineering Practices” Project. The objective of the project was to enhance management, planning, design, construction, maintenance and operations of all roads and road related infrastructure in the Emirate.

To achieve this objective a set of standards, specifications, guidelines and manuals were developed in consultation with the relevant authorities. It is anticipated that all road and road related infrastructure authorities or agencies in the Emirate shall adhere to these standards, specifications and recommendations. It is also recognized that there are already published documents with similar objectives and contents prepared by other authorities and these publications have been referenced in this document.

The scope of this Manual is to identify the appropriate policies and procedures in identifying and designating numbered routes in Abu Dhabi, such that it supports development of a logical route numbering scheme that aids in providing route guidance for drivers and in supporting the DoT and Municipalities in the development, operation and maintenance of the strategic road network. This route guidance covers the national-level wayfinding function and an intermediate wayfinding function, while the local wayfinding function is through the street names and addressing system implemented by the Municipalities.

## 1.3 Application of This Manual

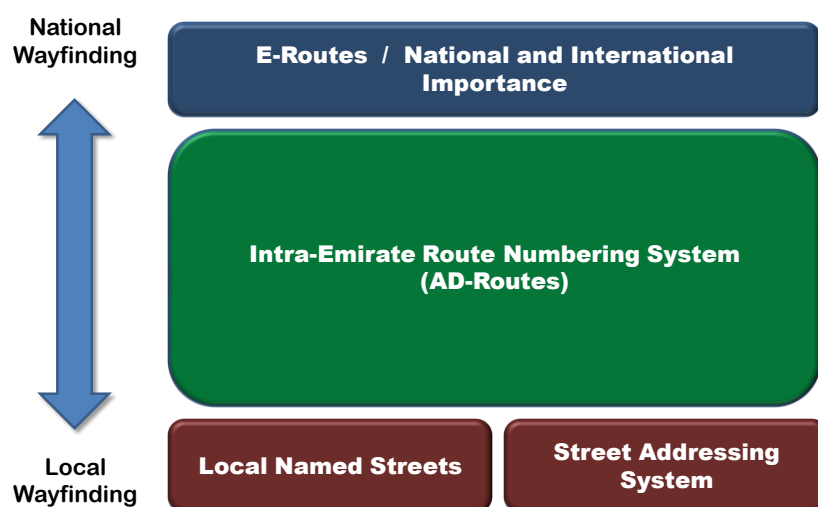
The intent of this manual is for route numbering of major routes to be used in conjunction with all other design manuals, standards, Guidelines, and practices. It is therefore to be used along with the practiced signage strategy and for Guide Signs design as per the MUTCD (Document TR-525, First Edition, 12/1/2016 or later) and current practice. The MUTCD has further information on control destinations (Table 24). For the Addressing System detailed later on in this section, the applicable manual is the latest approved version of *ISGL – Addressing System Standard Manual “Onwani”*. Specifically, for the addressing system, the *Geonames Standard and Practitioner’s User Guide* and *Signage Standard and Practitioner’s User Guide* apply.

A traditional challenge in the UAE has been providing directions to unfamiliar visitors. Over the years, providing directions in the region has involved using landmarks (buildings, businesses, and/or physical road features) as opposed to traditional street names and addresses as may be used elsewhere in the world. For growing and developing communities, this is more difficult, and thus providing recurring information on route numbering, road names and addresses will become more critical in the future. Current efforts at the municipal level (Onwani) has resulted in the development of street naming and building addressing systems that provide the backbone for specific locations and comprises the local wayfinding system. The local wayfinding through the street names system (addressing) links the district names with the street names. The street names are unique within a district and adjacent districts.

The Addressing system provides unique street names for approximately 6,750 streets in the Abu Dhabi Municipality jurisdiction area. This street network, combined with address numbers, has created addressing system guiding drivers from one identified address (street name plus address number) to another one. Unique address (street name with address number) supported with QR Code creates a solid and homogeneous addressing system. The Addressing System classifies street network similarly, however with different names, namely: Highways (out of AD Island), Main Streets, Secondary Main Streets, Internal Streets, and Rural Streets. These types of streets are the identifying types of the street name signs (SNS).

Conversely, the Emirate-wide road network must provide the “big picture”, travelling from one Emirate to another, one region or city to another, and then to the specific destination . There is a national-level wayfinding function and an intermediate wayfinding function between the major, nationally significant highways, and the major roads that connect to the local areas.

To this end, this Manual defines a hierarchy of international/national and inter-emirate roads (the E-routes), consistent with national practices, and intra-Emirate roads, the AD routes, that link these international/national and inter-emirate routes to local residential and business areas, destinations, and important transport, business and institutional centres. Figure 1 shows the relationships between two major levels of the Emirate-wide route numbering system and local street naming and addressing systems.



**Figure 1: Abu Dhabi Route Numbering System Framework**

Thus, logical route numbering and, where appropriate, tying this route numbering to particular road or street names can assist in providing quick familiarity with navigating a city or area.

As a result, the application of this Manual is intended for the following stakeholders:

- **DoT:** Marking of current and future routes, incorporating route information on guide signs, planning for future numbered routes, interface with international (Mashreq) route network
- **Municipalities:** Coordination with DoT on marking of current and future routes, incorporation of route numbering onto urban guide signing
- **Federal Transport Authority (FTA), Federal Ministry of Public Works (MoPW), other Emirates:** Guidance in standardizing the definition of E-routes throughout the UAE, provision of a review and approval process for implementing as well as delisting particular routes, and guidance in defining relationships between E-routes and intra-Emirate routes, as well as relationships with international “Mashreq” or M-routes.

## 1.4 Content and Format

The Route Numbering System (RNS) Manual content is presented in a paragraph format with numbered headings for readability and reference purposes. Maps and graphics are provided as appropriate, which illustrate the concepts and applications presented therein. As with many other route numbering systems in the world, there are defined, logical numbering schemes presented in this Manual, along with rules and processes for implementing these schemes. However, a certain degree of flexibility is always required in developing the numbering schemes, in response to national, regional or local needs or preferences, as well as in the interest of simplicity and non-duplication of numbering.

Thus, while there will be overall “Policy Statements” defined in the Manual, in general the RNS will be presented as a series of guidelines, primarily using “should” statements. These guidelines will thus provide the user with a statement of recommended practices for specific types of roads, in specific geographic areas, and in typical situations. “May” statements would indicate an option should a non-typical situation occur. The application of these practices may utilize engineering judgement and may take into consideration preferences from DoT and local authorities.

At the same time, however, specific processes in defining, approving, and implementing route numbering are prescribed in this Manual for future numbering activities, and may utilize specific responsible committees at the Emirate level (DoT) and National level (FTA) to reach a decision. Those processes, as with policy statements, may involve “shall” actions; denoting requirements contained within these processes – in this case, the steps that are to be followed by the user (i.e., the particular road operating entity) in recommending the implementation, reclassification, changing or removal of a particular route number.

As the Manual will both list and illustrate E and AD-route numbers to be deployed (if not already deployed), it will also serve to a great extent as an “Action Plan” for implementing in the future the RNS on roads where it has not been previously deployed, or where changes would be required.

The Manual is organized into the Chapters shown below:

1. INTRODUCTION. This initial overview of the Manual.
2. DEFINITIONS. Includes definitions of terminology and references to acronyms and abbreviations described in the Glossary at the end of this manual.
3. ROUTE NUMBERING SYSTEM. Description of the oversight responsibility for route numbering, definition of the road hierarchy, various route numbering levels (E and AD, plus international “Mashreq” or M-routes), physical and functional characteristics of each route level,

direction, sequence and continuity of route numbering, characteristics of the various route numbering levels, and functional characteristics, including major, minor, local, bypass and spur routes (for institutional, port, industrial and other access). Also included in the section is development of standards for kilometre posting, exit numbering and bridge numbering along the numbered routes defined in this manual.

4. **POLICY AND PROCESS FOR REQUESTING, REASSIGNING OR DELISTING ROUTE NUMBERS.** Describes the policy, processes for assigning new routes and reassigning route level status (e.g., changing E-routes to AD-routes and vice versa), transferring existing route numbers to new facilities, and delisting existing route numbers.
5. **LEGEND/MAPPING OF NUMBERED ROUTES.** Contains a list (with destination points and corresponding kilometre postings) and GIS-mapping of all E-routes and AD-routes along with connectivity between E-routes and AD-routes.

In addition, there are:

**REFERENCES,** which identifies international and UAE reference documentation for development of route numbering system.

**GLOSSARY,** which Identifies phrases and acronyms commonly used throughout the Manual.

**APPENDIX,** which includes Forms for requesting, reassigning, or delisting route numbers

## 2 DEFINITIONS

### 2.1 Overview

Definitions of headings, words, and phrases are provided in this chapter and in the Glossary at the end of the Manual. As discussed above, this manual includes policy statements (“shall” statements defining overall route numbering system characteristics), guidelines for Route Numbering System (RNS) development (using “should” and “may” statements), but may also contain requirements (“shall” statements) where needed in order to follow a specific process as stipulated in the Manual.

#### 2.1.1 Definitions of Headings, Words, and Phrases in This Manual

The following qualifying words are found in this manual and are used for consistency and uniformity relative to the headings above.

1. Shall. A mandatory condition. Users are obligated to adhere to the criteria and applications presented in this context or to follow the process indicated. For the application of functional and physical criteria for particular route levels within the RNS, this manual limits the use of these words.
2. Should, recommend. An advisory condition. Users are strongly encouraged to follow the criteria and guidance presented in this context, unless there is reasonable justification not to do so.
3. May, could, can, suggest, consider. A permissive condition. Users are allowed to apply individual judgment and discretion to the criteria when presented in this context. The decision will be based on a case-by-case assessment.
4. Desirable, preferred. An indication that the user should make every reasonable effort to meet the criteria.
5. Ideal. Indicating a standard of perfection (e.g., all E-routes meeting all aspects of the E-route functional and physical criteria).
6. Minimum, maximum, upper, lower (limits). Representative of generally accepted quantitative or descriptive criteria, but not necessarily suggesting that these limits are inviolable. However, where the criteria presented in this context will not be met, the user will in many cases need approval.
7. Practical, feasible, cost-effective, reasonable. Advising the user that the decision to apply route numbering criteria should be based on a subjective analysis of the anticipated benefits and costs associated with the impacts of the decision. No formal analysis (e.g., cost-effectiveness analysis) is intended, unless otherwise stated.
8. Possible. Indicating that which can be accomplished.
9. Significant, major. Indicating that the consequences from a given action are obvious to most observers and, in many cases, can be readily measured.
10. Insignificant, minor. Indicating that the consequences from a given action are relatively small and not an important factor in the decision-making related to route number selection.
11. Criteria. A term typically used to apply to functional and physical requirements that are applied in making a decision.
12. Typical. Indicating a practice which is most often used in application and which is likely to be the “best” treatment for a given road or region or application.
13. Target. If practical, target criteria is the criteria the user should be striving to meet. However, not meeting these criteria will typically not require a justification.
14. Acceptable. Design criteria that do not meet desirable values, but yet is considered to be reasonable and safe for design purposes.



15. Policy. Indicating a practice which the DoT expects the user to follow, unless otherwise justified through engineering, operational or other criteria.

## 3 ROUTE NUMBERING SYSTEM

### 3.1 Overview

This section sets out the overall Policy Statement for route numbering in the Emirate of Abu Dhabi, and how this Manual addresses this Policy.

#### 3.1.1 Policy Statement

1. Emirates (“E”) Routes. The DoT shall recommend international and/or nationally-significant routes (current and proposed) within the Emirate of Abu Dhabi as E-routes provided they meet the criteria of E-routes as defined in section 3.4 of this document. The establishment of an E-route system as a guide for inter-emirate travel over certain roads has no connection with federal control or the designation of Federal funds for road construction and/or operation. These E-numbered routes may recognize a road within the Emirate which is serving inter-emirate or international traffic and are under that emirate jurisdiction where it passes. However, designation or redesignation of E-routes shall be made by the Federal Transport Authority – Land & Maritime (FTA) of the UAE based on recommendation of the DOT
2. Abu Dhabi (“AD”) Routes. The DoT shall designate those strategic routes of regional significance (current and proposed), but that do not meet the criteria of E-routes, as AD-routes. AD-routes may connect with E-routes or other AD-routes on either end, or provide access to strategic destinations such as major transportation, government, or industrial facilities that serve significant traffic. Any such designation will come into effect only after appropriate overall approval as mentioned in Section 1.2 of this manual.
3. Mashreq (“M”) Routes. The DoT shall incorporate international M-routes designated by the United Nations Economic Commission for Western Asia (UNESCWA) within current E-route or AD-route corridors so as to provide the M-route designation alongside the E-route or AD-route designation.

#### 3.1.2 Background

This Manual focuses particularly on the designation of E-routes within Abu Dhabi as well as the designation of intra-Emirate AD-routes, including functional and physical attributes of these levels of routing, including logical, geographic and functional numbering schemes derived from the best international practices.

As the largest physical Emirate in the UAE, Abu Dhabi contains a diverse array of cities (Abu Dhabi, Al-Ain, Madinat Zayed, etc.), growing developments, and rural regions and settlements. Hence, there are regionally and locally-significant networks of roads as well as the need for connections between the major cities and settlements. Additionally, there is a need to provide route guidance to the public as well as a facility-oriented asset management tool for DoT staff.

In 1990, Federal transportation planners defined a national Emirates route numbering system, consisting of a series of “E-routes” representing nationally and internationally significant high speed roads within the UAE. The purpose of the E route numbering and marking system is to facilitate regional, inter-emirate and international travel on these high speed arterials, over the shortest routes. To serve that purpose a system of major inter-emirate routes was designated, and a uniform system of guide signs was adopted for use in all the emirates of UAE, on such designated routes. They are identified by an emblem of a falcon, the letter E and a two-digit number with exception to a bypass route which has a three-digit number.

The E-route system was originally established in 1995 and updated in 1999 and again in 2003. It is intended, by uniform marking of a route in two or more emirates (with few exceptions), to primarily facilitate the movement of Inter-emirate traffic. Demands of inter-emirate and international traffic have increased since then. New construction has opened up newer, better and shorter routes. The UAE E-route system should thus be reviewed and revised considering the ongoing and planned expansion in the road network and formal definition of E- routes.

This Manual provides a formal definition of E-routes considering the original intent of establishment of E-route system, as well as current practices in the development of new E-routes by Abu Dhabi DoT, Dubai RTA, and the Federal Ministry of Public Works.

A second level of route numbering is intra-Emirate in nature. In this Manual, such routes are called Abu Dhabi routes, or “AD-routes”. AD-routes are defined in this Manual in order to identify regionally significant roads that provide continuity and connectivity with the rest of the road network, but that do not cross into other Emirates. These specifically support route guidance between communities and linkages between the nationally-focused route network and locally-important districts and destinations. Intra-Emirate route numbering is also used in several other Emirates, including Dubai (since the late 1990s) and more recently Sharjah and Fujairah.

A third, top-level numbering system has been defined by the United Nations Economic Commission for Western Asia (UNESCWA). Labelled as international Mashreq routes, or M-routes, these provide international routes connecting various countries in the Arab Mashreq. As there are only a limited number of M-routes defined within the UAE and Abu Dhabi in particular, these are addressed in the Manual as an “overlay” upon the E-route and AD-route network.

## **3.2 Committee**

The development of an RNS for Abu Dhabi Emirate and its ultimate implementation will entail an RNS Committee including DoT Executive and Main Roads staff, including planning and operations/asset management personnel. However, the process will also involve and the concerned Municipalities who may be responsible for operations within their urban environments (e.g., Abu Dhabi, Al Ain and Western Region Municipalities), and national experts who are involved in designating and constructing nationally-significant roads. These include:

- National oversight – FTA (for Mashreq and E-routes).
- Nationally-significant road development – MoPW (particularly in the Northern Emirates), Dubai Roads and Transport Agency (RTA), and Abu Dhabi DoT.

E-route designations and emerging changes to these designations should involve all the above authorities, as each has roles in defining and developing national E-route numbers.

In contrast, AD-route designations are best handled through DoT and potentially the Municipalities, under supervision of the DoT RNS Committee.

Chapter 4 will specifically address the processes of designating, revising and delisting route numbers.

## **3.3 Road Hierarchy**

The “road hierarchy” can be defined several ways.

For example, the RNS hierarchy can be defined in order (top down) as M-route (pre-defined at the international level), E-route and AD-route.

However, the nature of these routes needs to be better defined, including not only the destinations served by the route, but number of lanes and carriageways, design speed, level of access control, route length, forecasted and actual traffic volume, use by commercial vehicles, public transport, etc. This is addressed in more detail below.

### **3.3.1 Strategic Road Network**

The Strategic Road network shall include those roadways providing connections and links for international/regional trips and any roadway connecting or providing access to strategic destinations and/or serving as a major freight route. For this purpose, strategic destinations would include airport, military facilities, major public attractions, economic developments of regional significance such as oil installations, seaports, etc.

The characteristics of roads that comprise this Strategic Road Network are defined as thus:

- Focus on the mobility function of the road
- Form a coherent network (without isolated links) across the Emirate and to neighbouring states
- Provide for journeys to and between significant settlements, business districts, key facilities including airports and ports and international facilities
- Include all roads that have a significant “through” or longer-distance traffic role
- Include “specialist routes” such as expressways, truck roads and Protocol Roads (those routes of major importance to the government relative to VIP’s and dignitaries visiting the Ruler and other senior government officials)
- Parallel routes that perform complementary roles as well as other major roads that have a significant effect on radial routes from the major cities in the Emirate
- Routes that will support major public transport activities, including light rail, express bus, etc.

Non-urban Strategic Roads are proposed to include:

- International Links
- Roads linking significant settlements and key locations (ports, airports and major developments)
- Truck routes
- Continuous routes, extended into/through the urban areas of Al Ain and Madinat Zayed.

In summary strategic roads shall provide international, inter-regional and inter-urban mobility and provide connections to strategic destinations within the Emirate..

### **3.3.2 Functional Classifications and Hierarchy**

There are several functional classifications associated with Strategic Roads, including the following, in hierarchical order (top down):

- Freeways/Motorways (fully controlled access, all grade-separated junctions, dual carriageways, 100-120 km/h speed limits, no parking or bus stops along carriageways)
- Expressways (partially controlled access, mostly grade-separated or large-diameter roundabouts, dual carriageways, 80-100 km/h speed limits, no parking or bus stops along carriageways)

- Primary Arterials (no median crossings between signalized intersections or roundabouts, usually dual carriageway with curb, walkway or barrier separation and slip ramp access to frontage roads and parking, may include bus stops and turn outs)
- Secondary Arterials (dual carriageway, walkway or barrier separation and slip ramp access to frontage roads and parking, may include bus stops and turn outs)
- Rural Arterials (single or dual carriageway, through routes connecting other major arterial, freeway or expressway routes, may intersect at roundabout or signalized intersections)

Within each of the above categories, routes may be of different lengths, carry different traffic volumes, and may be of varying significance relative to carrying non-local traffic. However, all of the above would be candidates for route numbering, provided they adhere to the functional operations and definitions presented for the different types of routes below.

## 3.4 E-Routes

### 3.4.1 Definition

As per current Dubai and Abu Dhabi traffic control device manuals, as well as unofficial but *de facto* Federal criteria for E-routes as per the UAE Ministry of Public Works, Emirates routes or E-routes are the most significant highways from a national perspective.

In summary, for the purposes of the RNS, the definition of an E-route includes the following.

- Provide through travel between two or more Emirates, or international crossing
- 150 m minimum right-of-way width to accommodate dual carriageway facilities (minimum 100 m width acceptable in urban areas)
- Limited-access (i.e., expressway) or controlled-access (i.e. freeway)
- No signalized at-grade junctions
- Speed limit of 100 km/h or higher

Under current practice, in urban areas throughout the UAE, E-routes are typically assigned to freeways and expressways. This is true particularly in the greater Abu Dhabi City and Dubai areas.

Not all freeways have to be E-routes. However, it is recommended that all E-routes be either freeways, or expressways that are readily upgradeable to freeway status.

However, in rural areas, not all roads designated as E-routes are yet designed with limited access, and some currently-marked E-routes in the UAE have signalized roundabout intersections. It is understood that such routes are planned to be upgraded to full controlled-access routes with directional interchanges and no at-grade crossings or roundabouts.

Still other E-routes may be currently designated as single carriageway roads with at-grade intersections. This Manual discourages the use of E-route designations for such facilities.

### 3.4.2 E-Route Numbering

#### 3.4.2.1 Principles (Numbering and Directional Sequence)

E-route Numbering principles as have been traditionally defined are based on a national grid pattern with primary and secondary E-route designations as follows:

- Primary E-Routes should be two digits and, across the UAE, range in number from E10 to E99
- Even numbered routes generally travel east-west or in parallel with the Arabian Gulf Coast, and should be generally numbered downward from the Gulf inland
- Odd numbered routes generally travel north-south or perpendicular to the Arabian Gulf Coast, generally numbered upward from west to east
- Bypass routes which start and finish at different points along a Primary E-route are given a three-digit designation, with the first digit being a sequential number assigned to the bypass, and the last two digits referring to the route number being bypassed.
- Note: Current three-digit routes in the UAE include E311 (Emirates Road) and E611 (also known as Dubai Bypass), neither of which are yet completed through Abu Dhabi Emirate. These E-route numberings may need to be reviewed in the future in light of formal definition of E- routes, given the extensive length of these routes.

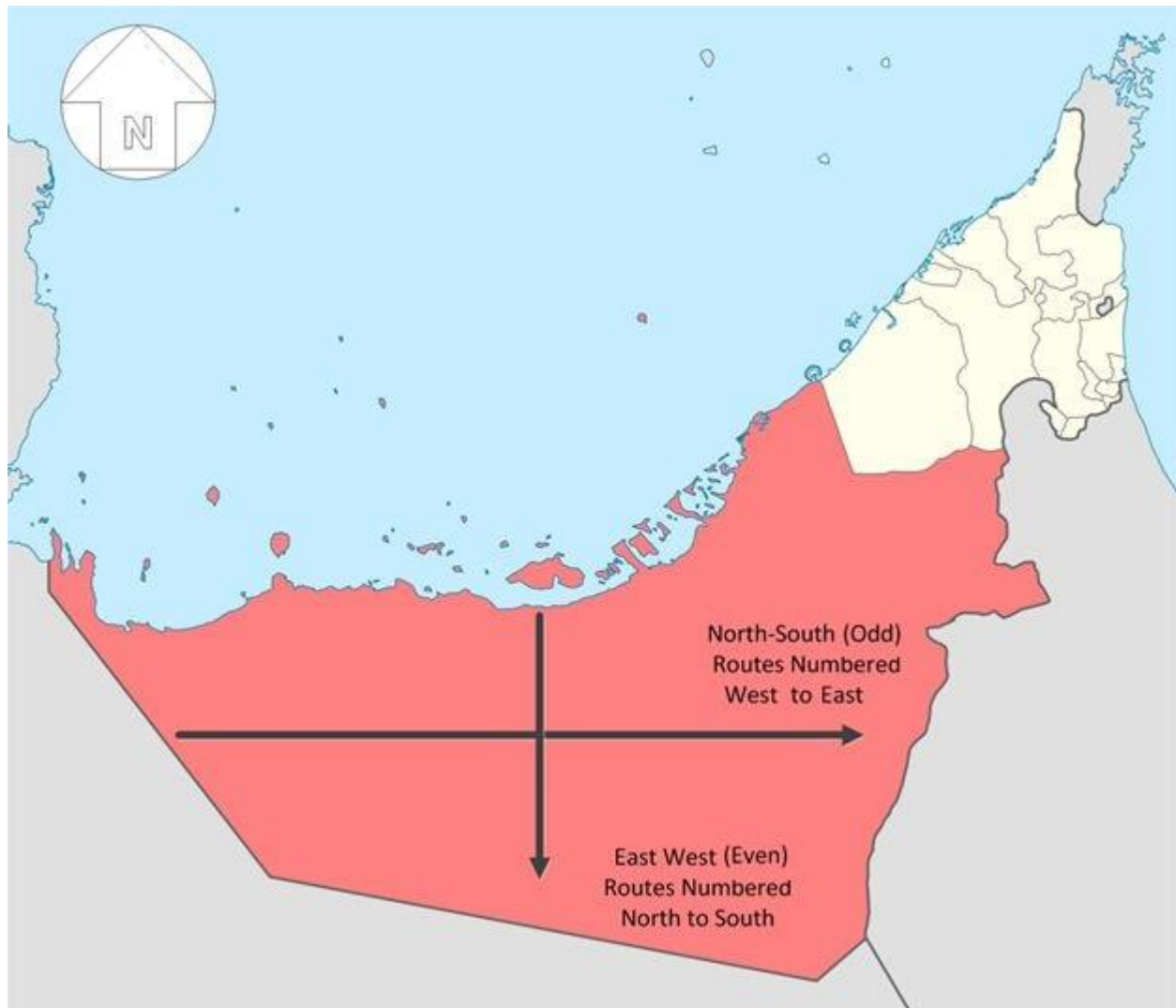


### **3.4.2.2 Current Practice**

The above principles have not been universally followed in Abu Dhabi, in part because the Gulf shore changes from a largely east-west orientation in the western portion of Abu Dhabi to a southwest-northeast orientation in the eastern portion of the Emirate. Because so many of the currently-deployed E-routes do not precisely follow the above principles, the process of E-route numbering requires coordination and cooperation with other Emirates.

In practice, the current lowest-numbered odd number route is E11, which runs east-west in parallel with the Arabian Gulf Coast throughout the UAE. The highest-numbered odd number route is E99, which travels along the Gulf of Oman (Indian Ocean) in Fujairah and Khor Fakkan (Sharjah), generally running north-south.

At this time, the current lowest-numbered even number route in both Abu Dhabi and the UAE is E10, which runs along the Gulf as a spur route from E11 between Shahama (about 30 km northeast of Abu Dhabi along the Arabian Gulf) and Abu Dhabi City. The second-lowest numbered route is E12, which travels north-south through the Yas and Saadiyat Island communities to the east of Abu Dhabi City. The fact that E10 and E12 lie to the east of Abu Dhabi City is significant because the westernmost portion of Abu Dhabi Emirate is some 300 km to the west. In fact, several north-south routes in the Western Region have been assigned E-route designations with odd numbers ending in 5, including E15, E45, and E65. Table 1 provides a list of current E-routes.



**Figure 2: E-route Numbering Progression Principles**

Currently, the highest-numbered even number E-route that is currently marked is E88, which travels from Sharjah to Fujairah across the Hajar Mountains. However, Abu Dhabi DoT has designated an east-west route through Liwa as E90 and a north-south route from Al-Ain south to Umm Az Zamil as E95.

In Dubai, a situation occurs with E44 (which travels toward Hatta) and E66 which travels toward Al Ain. Except for a short section in Dubai city, E66 mostly travels to the west of E44. Finally, route E18 exists in Ras Al Khaimah, well to the east of Abu Dhabi and Dubai and the aforementioned routes E20, E22, E30, E44, and E66.

**Table 1: E-Route Designations in Abu Dhabi**

<b>E-Route Number</b>	<b>From</b>	<b>To</b>	<b>Approximate Length (km)</b>	<b>Comment/Exception to Current Guidance Per TCD Manuals</b>
E10	Sheikh Zayed Bridge	E11 at Al Shahama	26	Spur from E11, even-numbered but runs east-west; follows old Dubai-Abu Dhabi Road, does not serve multiple Emirates.
E11	Ghwaifat (KSA border)	Saih Shueib (Dubai border)	415	Runs parallel to Gulf from KSA to RAK, oriented mainly north-south east of Abu Dhabi
E12	Sheikh Khalifa Bridge	E11 at Al Falah	35	Even-numbered, but mostly east-west route, runs across causeway and connects Yas and Saadiyat Islands on both sides. Travels only within Emirate.
E13	E15 at South of Ghayathi	E45 at Madinat Zayed	90	Odd number, parallel and south of E11. Travels only within Emirate.
E14	E11 at Ajban	E66 at Al Faqa	84	Northernmost east-west route, but even-numbered. Travels only within Emirate.
E15	E90 at Al Arada	E11 at Ruwais	145	Odd numbered, but travels north-south. Travels only within Emirate.
E16	E11 at Al Rahba	E22 at Al Yahar North	100	Even-numbered but travels east-west. Travels only within Emirate.
E20	Al Musaffah Bridge	E66 at Al Haiyir	101	Formerly designated E33. Even-numbered but travels east-west. Travels only within Emirate.
E22	Al Maqta Bridge	Al Ain (Al Yahar North)	115	Even-numbered but travels east-west. Travels only within Emirate but connects to two border crossings through Al-Ain.
E30	E22 at Musaffah	Merge with E40 near Al Ain	120	Truck Road, runs parallel to E22. Travels only within Emirate.
E40	E30 at East of Khatam	E95 at Al Ain (Al Faydah)	78	Truck Road, runs parallel to E30 truck road. Travels only within Emirate.
E45	Liwa City	E11 at Tarif East	110	Odd numbered, but travels north-south; formerly designated E12
E55	E66 at Khdar	Umm Al Queen R/A (Dubai border)	17	Odd numbered, but travels north-south. Connects north into Dubai, Sharjah and UAQ
E65	Himeem (E90 Jct)	E11 at Al Muquatar	145	Odd numbered, but travels north-south. Travels only within Emirate.
E66	Al Ain (Al Hili)	Saih Shueib (Dubai border)	60	Connects to Dubai, route to Oman vial Al Ain. Travels only within Emirate.
E75	E30 at Al Faya	Saih Shueib (Dubai border)	97	Truck Road connecting E30 in south to E11 and E311 to Dubai. Travels only within Emirate.
E90	(E95 Al Arada (E15 Jct)	Umm Az Zamul (E95 Jct)	223	Even-numbered but travels east-west. Southernmost, highest even-numbered route in AD. Travels only within Emirate.
E95	E40 at Al Ain (Al Faydah)	Umm Az Zamul (E90 Jct)	187	Odd numbered, but travels north-south along Omani border. Highest numbered in AD. E99 is in Fujairah. Travels only within Emirate.
E311	E20 at Al Falah	Saih Shueib (Dubai border)	62	Alternate bypass route to E11 in Dubai,. Travel through multiple emirates including Dubai, Sharjah, Ajman.



### 3.4.2.3 **Conformity of Current Practice with E-Route Definition and Principles**

Number patterns appear to be lowest odd-numbered routes along the Gulf, with even-numbered routes travelling from low in north to high in south. E18 is in RAK, E44 is in Dubai, and E88 connects Sharjah and Fujairah. MoPW has proposed other E-routes as well for the northern Emirates.

Odd-numbered routes other than E11 generally run north-south, and appear to be lowest in west, highest in the eastern part of the Emirate.

Of the routes in Table 1, some routes do not adhere to the E-route definition and principles within Abu Dhabi Emirate as per Sections 3.4.1 and 3.4.2.

***As actual E-route numbering practices frequently differ for various reasons, selection of new E-routes as well as signing of current roads as E-routes shall be accomplished following the Processes defined in Chapter 4, as directed by the appropriate Policy Statements in that Chapter. In short, these processes call for the Federal Transport Authority to approve all E-route numberings in order to ensure full compliance with the definition of E- route and prevent duplication of route numbers elsewhere in the UAE.***

## 3.4.3 **Continuity of E-Route Numbering**

### 3.4.3.1 **Standards**

1. Continuity Across Emirates Borders: E-routes traversing between different Emirates shall maintain the same numbering across Emirates Borders so as to preserve the continuity of the route, assuming that the routes on both sides of the border meet the E-route definition in Section 3.4.1 of this manual.
2. Maintaining Continuity Within the Emirate: E-route numbers shall be continuous across a full corridor within the Emirate, and not be interrupted or split into separate segments without an E-route connection or continuity.
3. Changing of E-route Numberings Along a route: E-route numbers along a continuous route shall only change if a 2-digit route completely changes direction (e.g., a 90-degree turn or greater)
4. E-route termination: E-routes shall only terminate at the following:
  - a. Other E-routes
  - b. Boundaries of major cities where the E-route transitions to a major urban arterial (may include bridges into urban zones)
  - c. International border crossings

### 3.4.3.2 **Guidance**

For an E-route corridor travelling across Emirate borders, if one side's currently-marked E-route does not meet the E-route definition defined in Section 3.4.1, the E-routing continuity across borders may still be acceptable provided (a) the non-standard route offers connectivity to other defined E-routes meeting the definition in Section 3.4.1, and (b) the Emirate currently has documented financially constrained plan to upgrade the route to the defined level of operation and functionality described in Section 3.4.1. within five years.

***Example:** A freeway route is designated as an E-route, crosses into another Emirate, and becomes a single carriageway arterial road, which ends at a freeway junction with another E-route. If the route is part of a corridor that is proposed to be upgraded to a freeway through a master transportation plan (long term plan) or approved transportation strategic plan (short to medium term plan), it can maintain its E-route status.*

### 3.4.4 Route Marking

#### 3.4.4.1 Standards

1. **Shield and colours.** E-routes shall be marked with a blue shield (outline of the Federal seal) with gold numbering and English and Arabic lettering representing the route as an E-route, as shown in Figure 3.
2. **Installation of Route Markers.** E-routes shall be designated as follows:
  - a. On overhead guide signs specific to ramps and junctions with the route as well as on pull-through guide signs along the specific route.
  - b. E-routes shall be designated on kilometre-markers as a physical location reference for asset management purposes, along with incident management. Any existing fixed concrete distance signage (yellow signs on concrete monuments) shall be replaced with kilometre-markers on breakaway posts.
3. **Trailblazer Signage.** E-routes shall be referenced on trailblazer signage leading directly to the route along arterials. If overhead guide signs are used rather than trailblazers for signage leading toward E-routes, enclosure of the target E-route emblem in parentheses shall be provided.
4. **Indirect E-route Signage.** E-route numbers on crossing routes whose junctions are downstream from a specific sign location should only be shown in conjunction with a “TO” (English and Arabic) as per paragraph 3 above, except for guide signs designated for the interchange with that E-route. Current guide signage which primarily shows downstream E-routes rather than the current E-route should be modified in a timely fashion to reflect the current E-route and, as needed reference the downstream E-route with “TO” legends.



**Figure 3: E-Route Emblem (2 and 3 digit routes)**

### **3.4.4.2 Guidance**

The blue shield with yellow legend is typically placed with a white rectangular outline and is posted on guide signs, trailblazers, and with a smaller shield atop kilometre-posts. The layout, text, placement and configuration is as per Section 4.4.3.4 of the Manual on Uniform Traffic Control Devices.

## **3.5 AD-Routes**

### **3.5.1 Definition**

AD-routes will provide urban, regional and rural connectivity throughout the Emirate. They are defined as follows:

- Strategic roads of regional significance connecting key destinations, settlements and transportation terminals of National or Emirate-wide importance
- High-speed, limited-access and controlled-access (i.e., freeway) facilities that may connect into the E-route network on one end but do not connect to other E-routes or international ports-of-entry on the other end

The AD-route network shall also incorporate strategic roads (including freeway, expressway, and arterial) that have been previously designated as E-routes but do not meet the E-route description presented in Section 3.4.1. These would include routes that meet one or more of the following criteria:

- Do not travel into other Emirates or ports-of-entry.
- Are not constructed to limited-access or controlled-access standards.
- Contain signalized and at-grade intersections, including roundabouts.
- Are not designed for high-speed (e.g., 100 km/h or higher) travel.

AD-routes should intersect with at least two other numbered routes and/or transportation terminals, ending at a numbered route or transportation terminal. Exceptions may be for routes leading directly into airport or marine terminals that branch from E-routes or other AD-routes, as well as certain major urban routes that connect on both sides with either an E-route or other AD-routes.

Spacing between parallel AD-routes should be a minimum of 5 km, but may differ based on network layout and individual route directions.

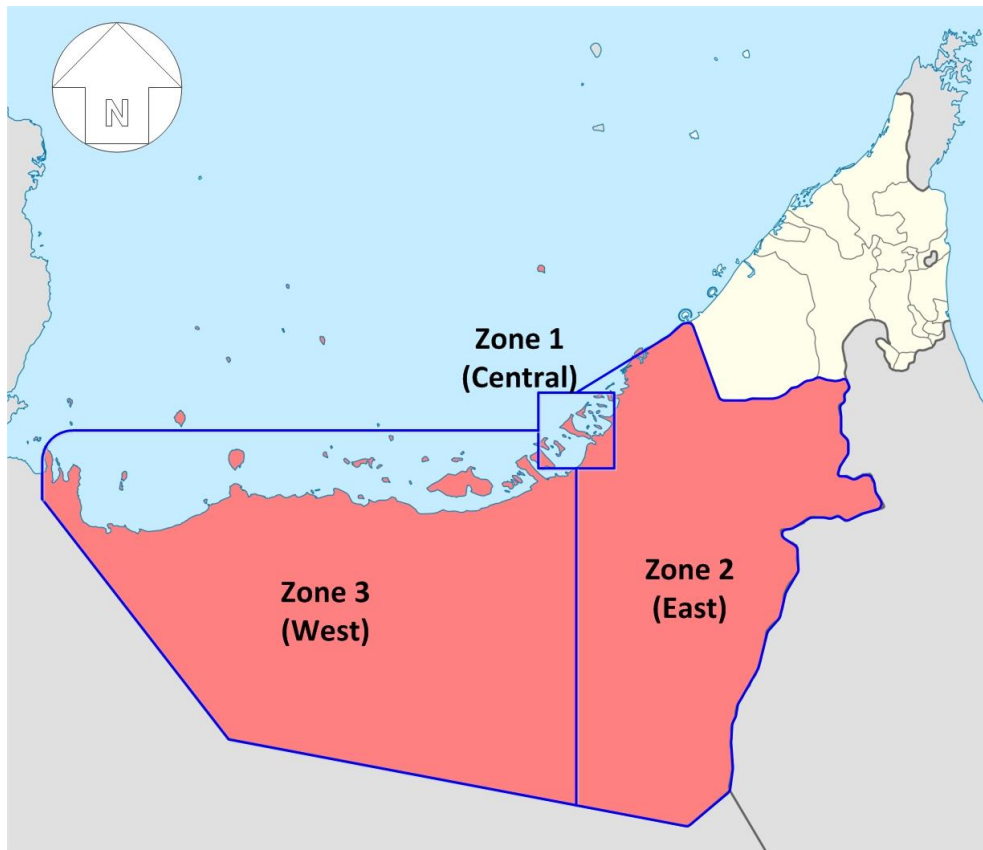
### **3.5.2 AD-Route Numbering**

#### **3.5.2.1 Principles**

1. General Principles. AD-route numbering is based on the following principles:

- a. Odd numbers for east-west routes (numbered from the north)
- b. Even numbers for north-south routes (numbered from the west)
- c. Division of the Emirate into three regional route numbering zones as per Figure 4.
  - i. Zone 1 includes the greater Abu Dhabi urban area including Abu Dhabi Island, Reem Island, Yas Island, Saadiya Island ....
  - ii. Zone 2 corresponds generally to the Eastern Region, including the coastal areas between Shahama and Dubai and south to Al Ain, Oman and Saudi Arabia
  - iii. Zone 3 corresponds generally to the Western Region

- d. Each zone is grouped into a series of 100 numbers, the first digit of which corresponds to the zone number.
- e. Routes that are continuous through multiple zones are to be numbered for the westernmost (east-west route) or northernmost (north-south route) zone the route is located in this Route Numbering Zone (RNZ) scheme will help the traveller with route guidance and navigation within the Emirate, and helps DoT track and manage road assets on a regional basis.



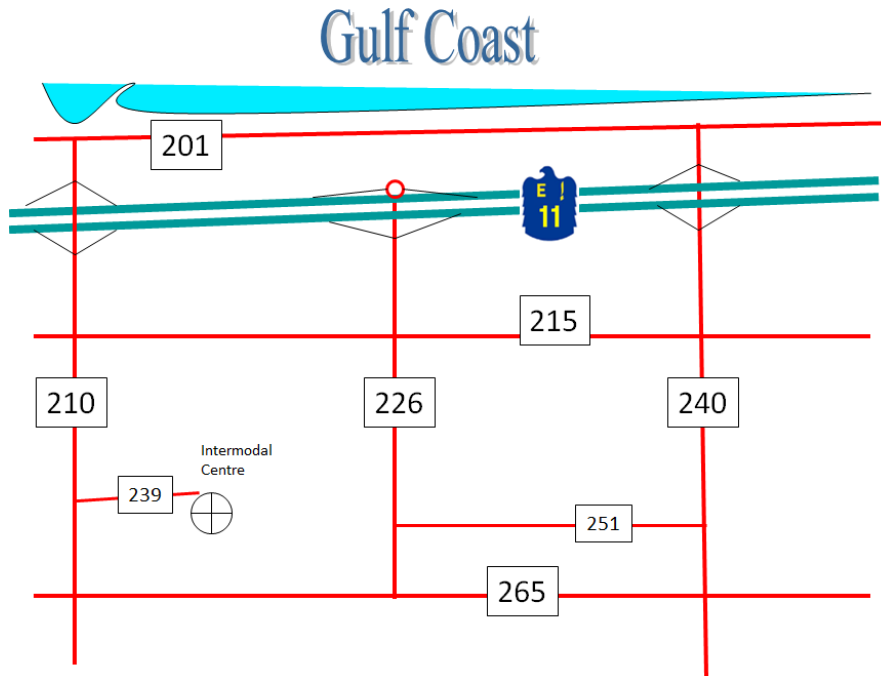
**Figure 4: AD-Route Numbering Zones**

## 2. Numbering Schemes

- a. Major routes of 20 km or more (including freeway and expressway routes) are to be numbered ending in “5” (east-west routes) or “0” (north-south routes). Routes less than 20 km in length may use other even or odd numbers. Route numbering sequence is from north to south (east-west roads) and west to east (north-south roads).
- b. Continuous routes travelling along the coast should receive an “01” designation for the last two numbers
- c. Branch routes to special destinations (e.g., particular industrial, recreational, intermodal, educational, cultural or government installations) should receive special three-digit AD-route designations ending in “9”

**Notes:** Ultimate configuration of intra-Emirate routes would occur as RNZ’s add development and population over time. Figure 5 utilizes the basic principles presented above to provide a sample layout of an RNZ, showing the route numbering grid, along with special routes and a major E-route (co-signed with an international M-route) traversing the RNZ.

In the example RNZ, AD-201 is the coastal arterial route, with AD-215 and AD-265 representing major east-west routes (ending in 5). AD-210 and AD-240 are major north-south routes (ending in 0). AD-251 and AD-226 represent shorter routes (east-west and north-south, respectively), while AD-239 represents a special spur route leading to a major destination, in this case an intermodal centre.

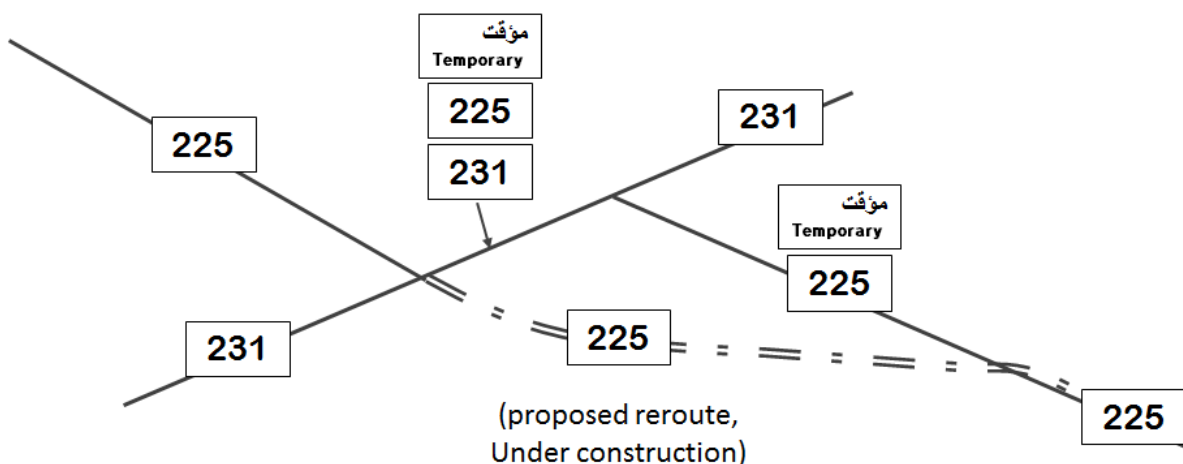


**Figure 5:** Example AD-Route Layout for a Generic RNZ

### 3.5.3 Co-Numbering of AD-Routes and E-Routes

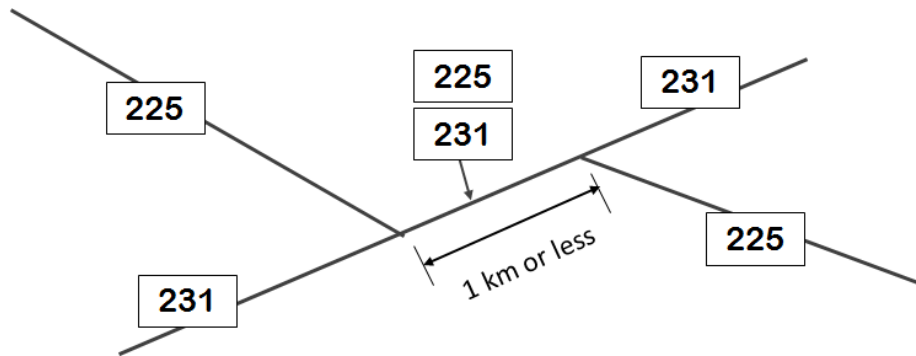
Applying multiple route numbers on a single stretch of road is not recommended except in the following circumstances:

- As a temporary connection between different road segments that are not yet completed as shown in Figure 6



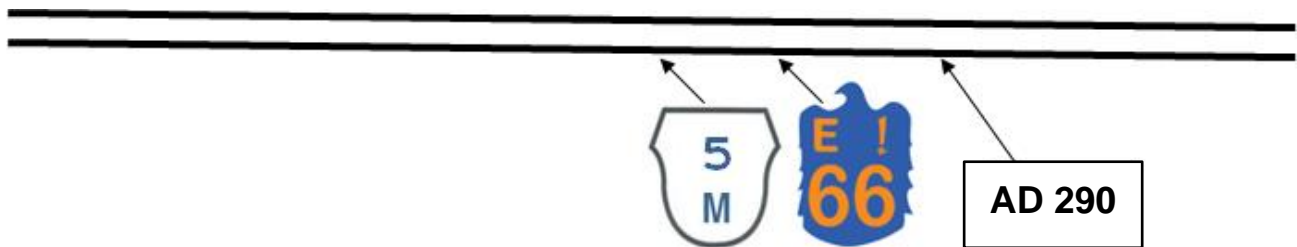
### Figure 6: Temporary Connection Between Incomplete Road Segments

- For distances of less than 1 km between the points where the two routes merge and diverge as shown in Figure 7



**Figure 7: Connection Between Two Routes Less Than 1 KM**

As Mashreq M-route numbering (discussed in Section 3.6 below) involves co-signing the M-route with either an E-route or AD-route, the co-signing of AD-routes and E-routes should be avoided whenever possible, particularly if the route is also an M-route.



**Figure 8: Example of unacceptable practice**

### 3.5.4 Route Marking

#### 3.5.4.1 Standards

- Emblem. AD-routes shall be identifiable by a distinctive emblem which maximizes the visibility of a 3-digit route identifier.



**Figure 9: AD-route Emblem Concepts**

- Colours. Route emblem selected by the Department shall utilize one of the following options:
  - be white against a green rectangular background with a white border around the rectangle and black numeric legend

- b. be white against a black rectangular background with a white border around the rectangle and black numeric legend
  - c. be green against a white rectangular background, with yellow numeric legend.
- 3. **Proportions.** The overall route sign proportions shall be 3 “x” high by 4 “x” wide. Number legend shall be contained within in the emblem and shall be black (on white emblems), and yellow (on green emblems). When placed on blue or green guide signs as described in Section 4.4 of the MUTCD, the emblem shall be of a size commensurate with the guide sign visibility and display requirements provided within the MUTCD.
- 4. **Installation of Route Signs.** AD-routes shall be marked:
  - a. At signalized intersections involving AD-routes
  - b. With signage on sign or street light poles upstream from the junction with an E-route or another AD-route as per Section 4.4.3.4 of the MUTCD
  - c. In conjunction with destination distance signage as per Section 4.4.3.4 of the MUTCD
  - d. On guide signs specific to ramps and junctions with the route as well as on pull-through guide signs along the specific route
  - e. In rural areas and on freeways and expressways, AD-routes shall be designated above kilometre-markers as a physical location reference in the case of vehicle breakdowns, and for asset management purposes.
- 5. **Trailblazer Signage.** AD-routes shall be referenced on trailblazer signage leading directly to the route along arterials.
- 6. **Indirect AD-route Signage.**
  - a. At an arterial intersection with a road which leads to another AD-route, trailblazer and chevron signage with just the route number and emblem may be provided, either separately or underneath other chevron or vertical stack guide signs
  - b. For freeway and expressway pull-through signage, a route number and the major destination accessed by that route may be placed underneath the route number and next major destination for the current route.

### **3.5.4.2 Guidance**

Section 4.4.3.4 of the MUTCD describes the dimensions, layout and configuration of AD-route signs. Upon official designation of the route emblem shape and colours by DoT, the MUTCD will be updated accordingly.

## **3.6 Mashreq Route Numbering**

### **3.6.1 Definition**

The Arab Mashreq International Road Network has been developed through an international agreement (Appendix C of this Manual), including the UAE and Gulf Cooperation Council (GCC)

countries, through the auspices of the United Nations Economic and Social Commission for Western Asia (UNESCWA).

Specific routes cover multiple international routes and nations.

### 3.6.2 Routes in UAE

Three routes that pass within or near Abu Dhabi as follows:

- **M5, Iraq, East Arabian Peninsula:** starting in Iraq, passing through Saudi Arabia to Al Ghweifat, Abu Dhabi, Dubai, Fujairah, Kalba, and into Oman (roughly follows the path of UAE E-routes E11, E88 and E99)
- **M7, Abu Dhabi to Sohar:** starting in Abu Dhabi, passing through Al-Ain and Buraimi to Sohar (follows the path of UAE route E22 as well as route AD-245 within Al-Ain)
- **M9, Al-Ain to Nizwa:** starting at Al-Ain, passing through Mazyad, Hafeet, and Nizwa (travels on route AD-298 south of Al-Ain to border with Oman).

### 3.6.3 Route Marking

To remain in compliance with this international agreement, those specific highways are to be signed using the designated shield illustrated in Figure 10 below.



**Figure 10: M-Route Marker**

The international agreement requires route numbering signs at 10 km intervals on first class freeways, at 20 km intervals on second-class roads, and at every point of exit and entry on the international road.

### 3.6.4 Co-signing with E-Routes and AD-Routes

All M-routes will be cosigned with those E-routes and AD-routes that comprise the M-route facility. For new roads that are specifically built to carry M-route corridor traffic, a corresponding E-route designation (for facilities meeting E-route requirements) or AD-route designation (for other primary roads carrying the M-route designation) is to be provided consistent with the route numbering principles above. As discussed in Section 3.5.3, signing of M, E and AD routes concurrently is an unacceptable practice.

M-routes will be shown next to or below the corresponding E or AD route number and emblem on guide signs located:

1. Ahead of junctions with other M-routes, or
2. At locations where the M-route utilizes an exit ramp or turns left or right.



## 3.7 Location Referencing

### 3.7.1 Definition

There are three types of location referencing to be implemented on main roads in Abu Dhabi with route numberings. One is related to driver location referencing for the purposes of navigation and recognition of locations by police and emergency services, and uses kilometre posting. The second is related to the numbering of freeway and other grade-separated interchanges, tied to the corresponding kilometre posting along the route. The third is related to the location and coding of road assets, including light poles, signs, signals, electronics, utilities and drainage equipment. The latter asset management needs are addressed in the DoT Roadside Design Manual.

### 3.7.2 Standards – Kilometre Posting

1. Basis for Kilometre Posting. Location-referencing along E-Routes and AD-Routes in Abu Dhabi shall be based on kilometre postings numbering upward from the westernmost and southernmost points for each road.
2. Kilometre Marker. A “kilometre marker” shall be provided on all freeways and expressways along with selected major arterial roads located outside of urban areas. The marker shall show, on top of a vertically-oriented kilometre posting, the E-route or AD-route shield with the distance to/from the origin of the road (either west or south) as illustrated in Figure 11 and detailed in Section 4.4.3.4 of the MUTCD. The marker shall be installed at the precise kilometre distance location on the right hand side of the road in each direction, located behind the guard rail or in conformance with the sign post installation requirements of Section 4.1 of the MUTCD.

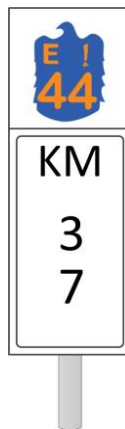


Figure 11: Kilometre Marker Display

### 3.7.3 Standards – Exit Numbering for Interchanges

1. General. Interchange numbering shall be used in signing each freeway and expressway interchange exit.
2. Location Basis. Interchange numbering shall begin at the western or southern terminus for each E-route or AD-route; this is true even for AD-routes that exist as a freeway for only a portion of the total route – interchange numbering shall be from the terminus. Exceptions are when DoT has designated a “zero” post at a specific location that may not be located on the route itself. For example, several E-routes emanating from Abu Dhabi City (E10, E12, E20 and E22) are posted based on the most direct driving distance from a designated origin at the

junction of Corniche Road and Sheikh Rashid bin Saeed Al Maktoum Street in Abu Dhabi, although the routes may not originate at this junction.

3. Interchange Signing. Interchange exit signing shall be configured as per the Abu Dhabi MUTCD, Section 4.4.5.10 and as shown in Figure 12.
4. Interchange Numbering for Co-signed routes.
  - a. For co-signed routes that are shared between E-routes and AD-routes, the E-route interchange numbering scheme shall be utilized
  - b. For co-signed routes that are shared between two different E-routes, the lower numbered E-route interchange numbering be utilized.
5. Interchange numbering on ring roads and spur routes. On ring roads and spur routes from E-routes (typically three-digit routes), interchange numbering shall be from the farthest west or northern connection to the 2-digit reference route
6. Continuity of exit numbering within Emirate. Interchange numbering shall be specific to each Emirate. E-routes crossing into other Emirates will utilize whatever interchange numbering scheme is specific to that Emirate.

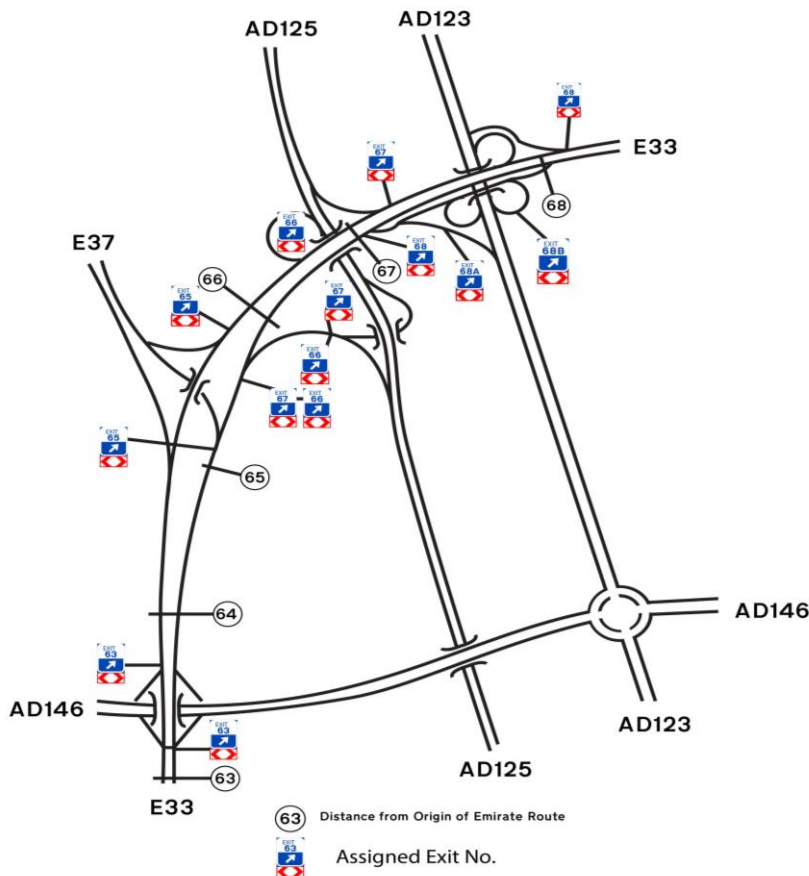


Figure 12: Illustration of Exit Numbering

## 4 POLICY AND PROCESS FOR REQUESTING, REASSIGNING, OR DELISTING ROUTE NUMBERS

### 4.1 Overview

This chapter delineates the processes for designating, changing, and delisting route numbers in Abu Dhabi Emirate. This includes a detailed process, checklists, forms, approval criteria, and business rules to be used in carrying out these activities. Appendix A provides the Route Number Request and Modification (RNRAM) form, which is further discussed in this chapter. It will serve as the primary basis for documenting requested route numbering system actions.

Because of the physical size of the Emirate and the requirements associated with implementing the E--routes and AD-routes presented in this Manual, formal processes and procedures are required for route number designation, assignment, transfer, and removal. Both DoT and the Federal Transport Authority will be engaged in this effort with respect to E-routes, and DoT will be responsible for (a) recommending changes to E-routes for approval by FTA, (b) the logical numbering of AD-routes, (c) consistent signing and asset management for E-routes and AD-routes along DoT maintained roads, and (d) coordination with Municipalities and other road operations entities (e.g., public-private road operations partnerships) on signing and managing the appropriate E or AD route numbering on specific roads they maintain.

### 4.2 Policy Definition

1. Committee on Route Numbering. A committee for assigning and approving route numbering shall be established within Abu Dhabi DoT . A suitable number of members for the committee shall be nominated by the Executive Director of Surface Transport and approved by the Chairman DOT. The committee shall be responsible for the following:
  - a. Receiving and reviewing requests for assignment, changing, or removal of route numbers from DoT staff, Municipalities, and other public or private road developer/operators.
  - b. Regular meetings to take decisions on route number requests (may be scheduled either when needed, monthly, or annually depending on the nature and frequency of such requests).
  - c. For AD-routes, specific authorization or rejection of route number assignment, change or removal and explanation of the rejection based upon the policies and principles presented in Section 3 of this Manual and the proposed numbering schemes documented in Section 5 of this Manual.
  - d. For E-routes, specific concurrence or rejection of route number assignment, change, or removal and explanation of the rejection based upon the policies and principles presented in Section 3 of this Manual and the proposed numbering schemes documented in Section 5 of this Manual. Following concurrence on E-route actions, the Committee chairman shall forward the request and the Committee's recommendation and justification to FTA for subsequent review and authorization or rejection.
2. Role of Federal Transport Authority (FTA). For decisions involving E-Routes, the DoT Committee on Route Numbering shall also engage the FTA, who would officially certify the E-

route designations forwarded from DoT (or reject them if deemed not appropriate for technical reasons), .

3. Processes and Procedures. The DoT, Municipalities and other public road developer/operators shall follow the detailed process, checklists, forms, approval criteria, and business rules described in this Chapter or any updates thereafter in carrying out the above activities. Specifically, the RNRAM form presented in Appendix A of this Manual shall be the primary tool in documenting route number requests for review and acceptance.

## **4.3 Process for Assigning New Routes**

### **4.3.1 Overview**

New route numbers are to be assigned following the principles identified in Chapter 3, using as a guide the route numbers assigned to current/future corridors as presented in Section 5. Figure 13 provides an overall process for AD-route and E-route requests as detailed in the requirements below.

### **4.3.2 Requirements**

#### **4.3.2.1 AD-Route Number Request**

Using the RNRAM form as found in Appendix A of this Manual, the responsible party (DoT, Municipality, or public road developer/ operator) shall submit the request to the Route Numbering Committee, following the instructions provided with the form.

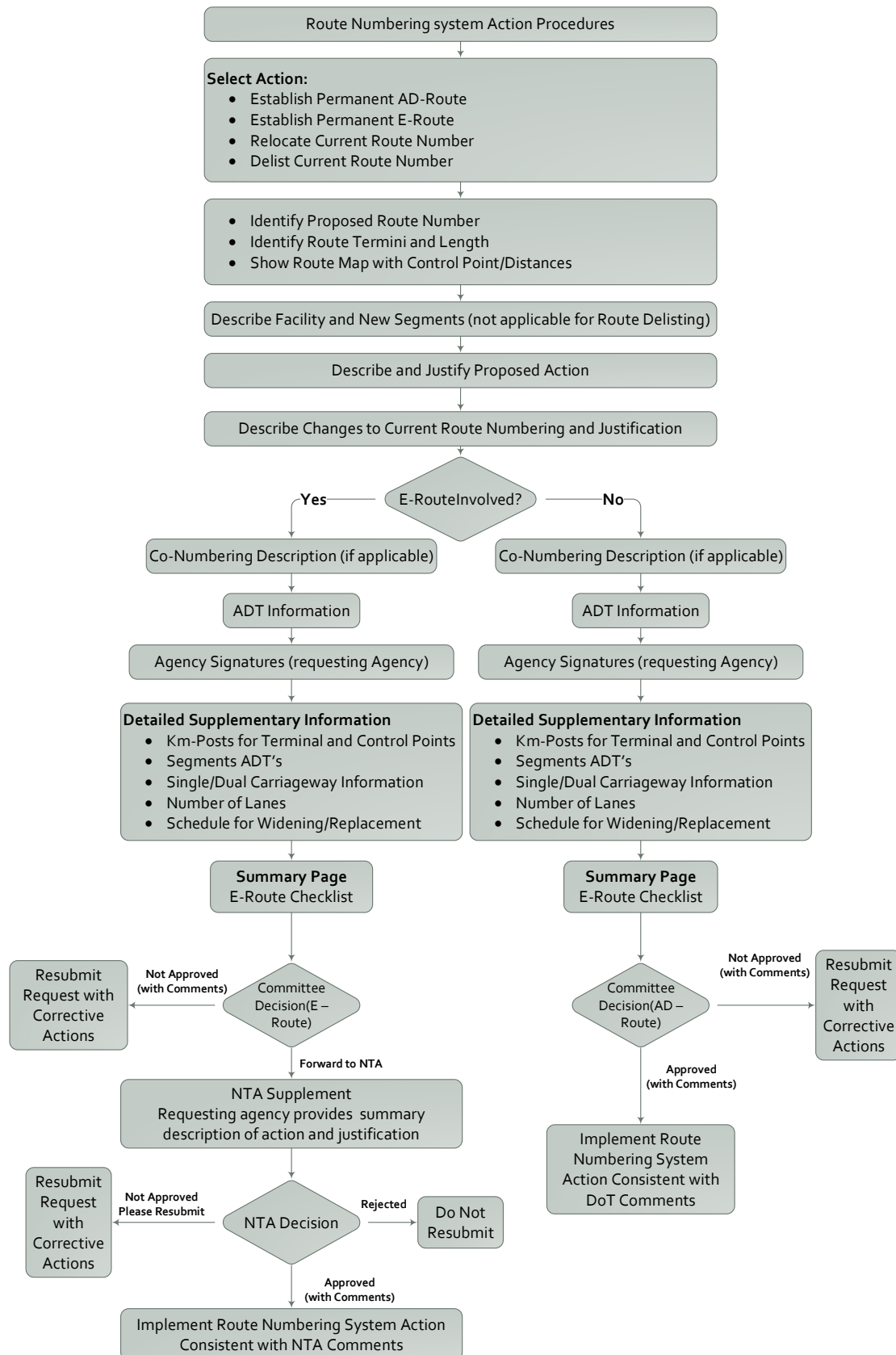


Figure 13: Route Numbering System Action Procedures

#### **4.3.2.2 E-Route Number Request**

Utilizing the RNRAM form as found in Appendix A of this Manual, responsible DoT, Municipality or public road operator staff shall utilize the procedures in Appendix A associated with E-route requests.

### **4.4 Process for Reassigning Existing Route Number to Another Facility**

#### **4.4.1 Overview**

When new highway segments are built as a replacement for existing facilities, or when a route number is transferred to a completely different facility, the RNRAM form is also used to address these proposed revisions.

#### **4.4.2 Requirements**

The process of reassigning existing route numbers to other facilities is documented in Appendix A along with the corresponding RNRAM form information.

#### **4.4.3 Guidance**

The process for relocating a route number due to building a replacement or bypass facility is relatively straightforward if the facility meets the requirements of the AD-route or E-route numbering principles, whichever are applicable.

However, if a route number (for example, an E-route) is proposed to be removed from one route in a particular region within the Emirate and relocated to a route in another region within the Emirate, specific justifications must be provided such that the route is located in a consistent fashion with the route numbering principles in this Manual. Further, in this summary page, the requestor should identify a transition process and period by which the route number would be transferred. This process should be preferably over the period of one year, and should be accompanied by the appropriate public information process.

### **4.5 Process for Delisting Existing Route Number**

If a route number is being relocated or transferred from one route to another route within the Emirate, the number's relocation will be detailed as per the process and requirements in Section 4.4 above and as described in the procedures in Appendix A. A delisting process is only required if an existing route number is being eliminated and no plans or initiatives exist for replacing the route number on that facility, or relocating to another facility.

The route number delisted shall become available for future use.

## 5 LEGEND/MAPPING OF NUMBERED ROUTES

This section presents a graphical presentation of the route numbering system for Abu Dhabi Emirate, including E-route and AD-route locations, utilizing both existing routes and proposed routes derived from Surface Transportation Master Plan, the Al-Ain and Al Gharbia Master Plans.

**NOTE: For all route numbers following a proposed or incomplete road or route, the location and distance information provided in this Chapter is approximate.**

Based on the E-route criteria as defined in Chapter 4, a revised designation of E-routes is reflected in this Chapter. For the most part, this has not significantly altered the most well-known E-route designations in the Emirate, particularly those in the Abu Dhabi City and Al-Ain City areas. However, E-routes that have been designated in rural regions but do not meet the E-route criteria have been redesignated in this Chapter as AD-routes.

It is important to understand that the E-route designations originally envisioned at the Federal level have changed in recent years within Abu Dhabi Emirate. In particular, it is useful to compare the E-route designations that Abu Dhabi DoT has previously maintained (2009-2010) with those issued in the map released by the UAE Ministry of Public Works (MoPW) in 2007. The most significant changes are as follows:

- The MoPW originally showed the road in the Western (Gharbia) region connecting Tarif with Madinat Zayed and Liwa (Al Mizeriah) as E12. DoT has applied the E12 designation to a route in a completely different location than above, and has instead designated this route as E45 although there appears to be limited signing to this effect. As the route currently has numerous at-grade intersections, neither enters another Emirate nor directly connects to a border crossing, it has been designated by this Manual as AD350.
- The existing E75 is a truck road that remains entirely within the Emirate, although it connects several E-routes in Zone 2. It is redesignated as AD215.
- The existing E30 and E40 truck roads also are contained entirely within the Emirate and contain several grade crossings and non-freeway interchanges. The E30 truck road is redesignated as AD130, while the E40 truck road is redesignated AD265.

Other E-route redesignations (or justifications for not being redesignated) are described in Section 5.1. Maps shown here and in Appendices B.1, B.2 and B.3 contain the following information and symbology (AD route emblems simplified to maximize visibility):



**Figure 14: Map Legend for E-Routes and AD-Routes**

## 5.1 E-Routes

The map of E-routes in the Emirate as designated by this manual is provided in Figure 15 . Included on this map are routes which have been previously designated as E-routes and which have been redesignated as intra-Emirate AD-routes. Table 2 provides a summary of the current E-routes as well as previously-designated E-routes that are redesignated as AD-routes based on the criteria provided in this Manual and the discussions at the beginning of this Chapter above. The summaries include endpoints for the route, length of the route, and justifications (including brief explanation of the route status).



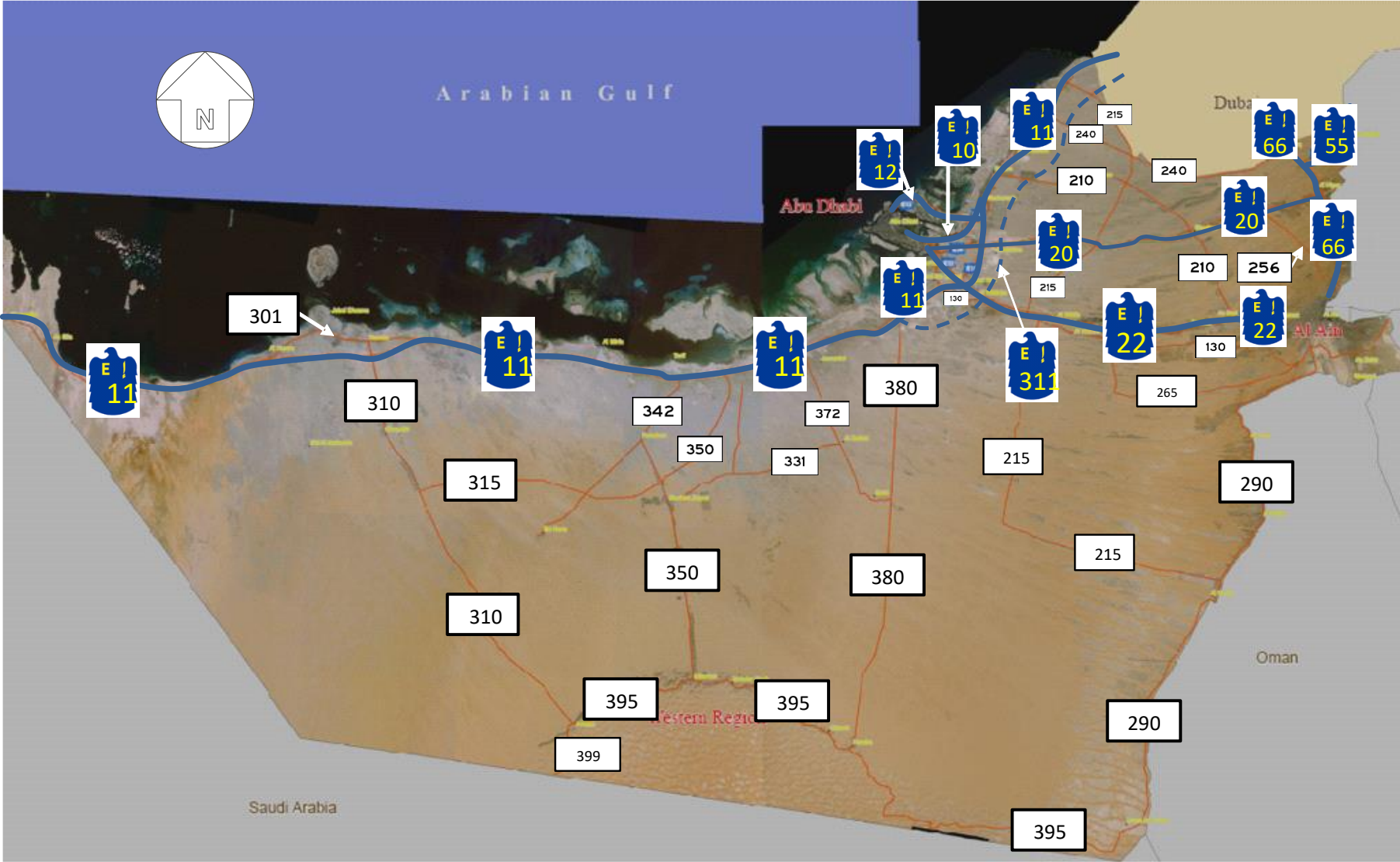


Figure 15: Routes and Redesignated AD-Routes

Table 2: E-Routes and Redesignated AD-Routes

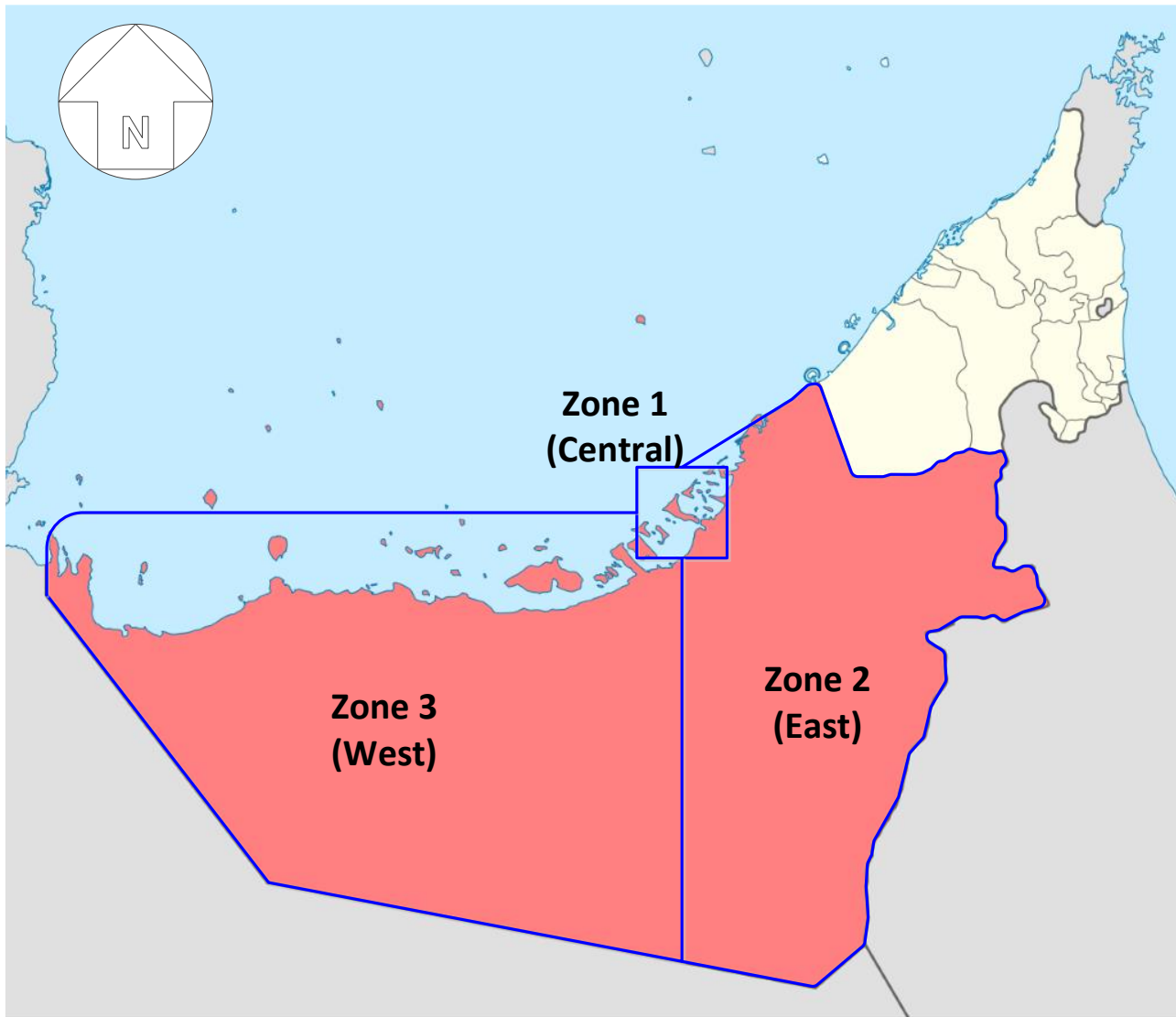
<b>E-ROUTES AND MAJOR AD-ROUTES (renumbered from E-routes)</b>				
<b>Route Number (E or AD)</b>	<b>Start Point</b>	<b>End Point</b>	<b>Distance (km)</b>	<b>Remarks / Redesignation</b>
E10	*Immediately after Sh. Zayed Bridge on Abu Dhabi mainland.	E11 - Shahama	45	Uses the freeway facility between Sas al Nakhl and Shahama through Al Rahah Beach and Al Bahyah.
E11	Al Ghweifat (border crossing with KSA)	Dubai border (Saih Shueib)	415	Relocation near Jebel Dhanna and Ruwais, old route becomes AD301. Entire length of route within Emirate is cosigned as Mashreq route M5.
AD301 (includes portion of old E11)	Jct E11 (west of Jebel Dhanna)	Jct E11 (east of Ruwais)	67	Old E11 (Jebel Dhanna/Ruwais area) bypassed by relocated E11.
E12	*Immediately after Sh. Khalifa Bridge on Saadiyat Island	E311 near Al Falah	35	Existing route from Saadiyat Island to E11 is 35 km.
AD315 (originally proposed as E13)	AD310 - Ghayathi	AD350-Madinat Zayed	96	Distance is approximate.
AD240 (includes former E14)	AD203 - Khalifa Port	E66 - Al Faqaa	91	Former E14 south of E11
AD310 (includes former E15)	AD395/399 Jct (Al Arada)	Ruwais Port	152	Former E15 (south of AD301), Ruwais to Arada via Ghayathi
AD210 (includes former E16)	AD201 - Al Ajban	E22 - Abu Samrah	100	Former E16 south of E11, Ajban Road,
E20	*Immediately after Musaffah Bridge on Abu Dhabi mainland	E66 - Al Haiyir	101	Follows after Musaffah Bridge onto Sweihan Road past airport, to Sweihan and E66.
E22	*Immediately after Maqta Bridge on Abu Dhabi mainland	Al Ain entrance (AD245/AD241 jct)	115	Follows after Maqta Bridge leading to AD245 within Al Ain City. route cosigned as Mashreq route M7 between E11 and Al Ain.
AD130 (includes former E30)	E22 - south of Maqta Bridge	AD845 just west of Az Zurub border crossing (Oman)	158	Former E30 (truck road), 120 km from Abu Dhabi to Al Ain south, route now continues through Al Ain to junction with AD245 just west of Oman border crossing (Az Zurub)
AD265	(see Table 4 -- Eastern Region)			Former E40 (truck road)
AD350 (Former E45)	AD395 - Al Mazeiraa	E11 - Tarif	110	Former E45

<b>E-ROUTES AND MAJOR AD-ROUTES (renumbered from E-routes)</b>				
<b>Route Number (E or AD)</b>	<b>Start Point</b>	<b>End Point</b>	<b>Distance (km)</b>	<b>Remarks / Redesignation</b>
E55	E66 – Khdar	Dubai Border at Shweib (Umm Al Quwain R/A)	17	Expressway, roundabout intersections, but connects to Dubai emirate.
AD380 (Former E65)	AD395 - Hamim	E11 - west of Al Maqatrah	145	
E66	Al Ain north entrance (AD290)	Dubai Border	60	
AD215 (Includes former E75)	E11 - Ghantoot	AD290 - Al Faya	232	Former E75 (truck road), extended south to AD-290 south of Al Wajah
AD395 (Former E90)	AD310/399 Jct (Al Arada)	AD 290 - Umm Al Zamul	223	Former E90, main road through Liwa and Rub Al-Khali
AD256 (includes part of former E95)	E20 between Sweihan and Nahel	Jct AD290 - Al-Ain (Al Masoudi)	38	Former E95 north of Al-Ain
AD290 (includes part of former E95)	AD395 - Umm Al Zamul	Jct E66 - Al-Ain (north)	215	Former E95
E311	Jct E11 east of AD380 junction	Dubai border (Saih Shueib)	102	Currently open between Dubai border and E20.
E611	To be decided in future (current start point is AD215)	Dubai border	To be decided in future, currently estimated 10 Km	To be decided in future

\* - Denotes that kilometre post information for the route is calculated from the junction of Corniche Road (Street 1) and Sheikh Rashid bin Saeed Street (Street 18) in Abu Dhabi City, rather than from Start Point

## 5.2 AD-Routes

The following section addresses all AD-routes originating in the specific Route Numbering Zones that were identified earlier in this Manual. A total of three zones (Western, Central and Eastern) have been established in the Emirate, as a basis for numbering intra-Emirate routes, known henceforth as AD-routes. Figure 16 illustrates the three zones.



**Figure 16: Route Numbering Zones**

The remainder of this section addresses the three route numbering zones. Because there are a number of routes traversing multiple zones, a summary table of route numbers is provided by region, along with the endpoints, route distance, and comments (including any unique attributes or exceptions to the route numbering criteria and framework presented in the manual).

### 5.2.1 Zone 1: Central Region

The Central Region encompasses Abu Dhabi City, the surrounding islands to the north and east, and the mainland portions of the region from west of Mafraq to Shahama and outward to outside the perimeter route (E311).

Three existing E-routes in the region, E11, E22 and E311, are either inter-Emirate, link with international border crossings, and generally follow (or are being constructed to follow) freeway design standards. The other routes with the existing designations E10, E12, and E20, have been built to freeway standards and serve a significant amount of traffic, including commuter traffic, as well as connect Abu Dhabi City to E11. They do not constitute E-routes based on the strict definition described in this Manual, but have been retained as such due to the extensive existing signage and familiarity by local travellers with these route designations.

There is significant connectivity between Abu Dhabi City and the mainland through three bridges at the south end of the Island and the route E12 connection from Sheikh Khalifa Bridge to Saadiyat and Yas Islands. However, in most cases, the E-route network merges into a surface street network, with several crosstown routes. The only direct connection (no signalized junctions) from the E-route network to the Corniche at the north end of the City is the Sheikh Zayed Tunnel which provides connections to Sheikh Zayed Street (also historically called Salam Street or Eastern Ring Road), Sheikh Zayed Bridge and route E10.

The major streets in Abu Dhabi City historically have maintained street numbering schemes that aid in navigation across the city. The primary streets within Abu Dhabi City meeting the Manual's criteria for AD-route numbering (routes carrying regional traffic) include the following:

- Corniche Road (1<sup>st</sup> Street) – connects to Sheikh Khalifa Bridge and main north-south routes below
- Shk. Rashid Bin Saeed Street (18<sup>th</sup> Street) – connects to Maqta Bridge and route E22.
- Sultan Bin Zayed the First Street (20<sup>th</sup> Street) – connects Corniche with 18<sup>th</sup> Street near Exhibition Centre, key parallel major route to 18<sup>th</sup> and Shk. Zayed Bin Sultan Streets.
- Al Khaleej Al Arabi Street (8<sup>th</sup> Street) -- The portion south of Shakbout Bin Sultan Street is access controlled with grade separations and connects to Musaffah Bridge and route E20)
- Hazza Bin Zayed the First Street (11<sup>th</sup> Street) – Connects Bateen Area with Al Reem Island and future Mid-Island Parkway
- Shakbout Bin Sultan Street (19<sup>th</sup> Street) – an east-west route that will connect to potential future routes to Saadiyat and to future Mid-Island Parkway.
- Shk. Zayed Bin Sultan Street (southern part) between Al Khaleej Al Arabi Street near Sheikh Zayed Mosque and Shk. Zayed Bin Sultan Street, providing connections with all three bridges at the south end of Abu Dhabi island

However, due to the implementation of the New Addressing System for Abu Dhabi City, the Main Streets numbering was retained as is.

Off the island, there are several main routes through Khalifa City and Shakbout City, Mohamed Bin Zayed City, and Musaffah which carry regional traffic through the communities and connect directly into the E-route network.

Abu Dhabi routes may be numbered between AD-99 and AD-199. The Region is documented as follows:

- Table 3 shows the summary table for AD-routes within the Central Region.
- Appendix B.1 provides maps showing different sections within Zone 1.

**Table 3: Route Number Summary for Zone 1 (Central Region)**

<b>CENTRAL REGION AD-ROUTES</b>				
<b>Route Number (E or AD)</b>	<b>Start Point</b>	<b>End Point</b>	<b>Total Distance (km)</b>	<b>Remarks</b>
AD119	Southern tip of Al Sadiyaat Island	Jct E12 @ Al Sadiyaat	4.2	Within Al Sadiyaat Island – southern spine
AD128	E11 exit 331	AD165 (Al Mafraq)	5.3	
AD130	Refer to Table 2	Former E30		
AD134	AD147 - Khalifa City	AD161 - Mafraq	15	16th St - Khalifa City, Zayed City (future relocation), 40th St - Shakbout City, and 42nd St - Al Shawamekh
AD141	AD104 (8th St-Musaffah),	AD155 (ICAD 1)	5.6	Current route - follows 7th St in Musaffah/ICAD 1.
AD144	Current: AD155 (Shakbout City)	AD165-Al Shamkha	17	Currently follows 72nd St in Shakbout City, 54th St in Al Shawamekh (8.5 km). Future expansion thru Capital District.
AD147	E10 to E22 connecting road	E10/AD184 jct (east end of Al Rahah)	12	Follows 5th St near Gulf Gardens and 3rd St in Khalifa City. Runs as parallel arterial route to the south of E10 (freeway)
AD149	AD141 (7th St - Musaffah)	E22 (initial), Zayed City (future)	21	Future route west and east of Musaffah, follows 8th St in Musaffah for 5.3 km and 79th St in Mohd bin Zayed City for 2.5 km
AD150	E10 – Shk. Zayed St. near Tourist Club	E10 east of Sas Al Nakhl/AD510 Jct	25	Proposed Mid-Island Parkway - future route
AD151	AD141 – ICAD	E22 (initial), Zayed City (future)	15	16th St - ICAD, 63rd St - Mohamed Bin Zayed City is existing segment (10.5 km), future extension east of E22 to Zayed City.
AD155	AD141 – ICAD	E20 between airport and E11	24	East-west route through ICAD, 51st St through Mohd bin Zayed City, 33rd St through Shakbout City
AD161	AD128 - Mafraq	AD165-Al Shamkha	17	Follows 31st St through Al Shawamekh
AD165	AD130 - Jarn Yafor	AD201 near Ras Ghanadah	68	1st St - Mafraq, Al Samkha, Al Falah, Al Ajban, Al Samha, connects to AD201 near Ras Ghanadah (Route Numbering Zone 2),

CENTRAL REGION AD-ROUTES				
Route Number (E or AD)	Start Point	End Point	Total Distance (km)	Remarks
AD168	AD174 - Al Falah (north)	AD165 - Al Shamkha	6	
AD174	E11/E12 Jct	AD165 - Al Falah	8	Arterial route running parallel to E12 to E311
AD178	E11/AD203 - Al Rahba	AD207 - South of Al Ajban	15	
AD184	E12 (Yas West)	AD180 (Al Rahah)	7.5	Completed from E12 to E10 via Ferrari World, F1 circuit and Yas Island Tunnel

\*km-posting starts from west or Gulf coast/north

## 5.2.2 Zone 2: Eastern Region

The Eastern Region route numberings are organized into five sections:

- Northern (coastal area from Al Bahyah to Dubai border)
- Central (inland area between Abu Dhabi, Northern section, and Al Ain)
- Al-Ain City
- Al-Ain / Omani Border Crossings
- Southern (Rub al-Khali, areas south of Al Ain)

All of the routes in this region previously designated as E-routes have been reviewed, and with the exception of E11, E20, E311, E22, E55 and E66, the routes have been changed to AD-routes, due to (a) the non-freeway nature of many of the facilities, and/or (b) the non-inter-Emirate nature of the facilities.

Route numbers may range between AD-201 and AD-299.

The Region is documented as follows:

- Table 4 shows the summary table for AD-routes within the Eastern Region
- Appendix B.2 provides maps showing each of the four zones.

**Table 4: Route Number Summary for Zone 2 (Eastern Region)**

EASTERN REGION AD-ROUTES				
Route Number (E or AD)	Start Point	End Point	Total Distance (km)	Remarks
AD200	E22 - Al Ain West	E66/AD290 Jct (Al Ain North)	31	Proposed expressway route parallel to AD237
AD201	E10-Shahama	AD165 - Ras Ghanadah	25	
AD203	E11/AD178 Jct	E11 - Ghantoot	34	
AD207	AD210	AD215	41	
AD210	See Table 2			Ajban Rd, Former E16
AD215	See Table 2			Former E75
AD237	E22	AD256	31	
AD240	See Table 2			Former E40
AD241	AD130	AD290 - Al-Ain Town Centre	30	
AD243	AD215	E22 - Al Khatim	29	
AD245	E22/AD241 Jct	Az Zurub Border Crossing (Oman)	56	Mashreq route M7 cosigned with this route
AD254	AD120	AD265	16	
AD256	See Table 2			
AD265	AD215	AD130	86	Formerly E40 (Truck Road)
AD278	AD237	Jct AD290/130	15	138th St
AD286	AD265	AD290	9	
AD290	See Table 2			Former E95
AD298	AD245/AD290 Jct (Town Centre)	Mazyad Border Crossing (Oman)	22	

\*km-posting starts from west or Gulf coast/north



### 5.2.3 Zone 3: Western Region

The Western Region is organized into three sections, including the northwest, north central (includes Madinat Zayed), and Liwa.

In general, except for E11 (an existing limited access road being upgraded in the near future to a full freeway operation) and the proposed E311 which starts in Zone 2, all of the routes in the three zones will be AD-routes. As discussed in Section 5.1, several of these routes had previously received E-route designations, but are not currently nor in the foreseeable future expected to meet the criteria for being labelled an E-route.

The Region is documented as follows:

- Table 5 shows the summary table for AD-routes within the Western Region.
- Appendix B.3 provides maps showing Zone 3, each of the three sections, and specific detailed subareas where there is a larger concentration of numbered routes.

**Table 5: Route Number Summary for Zone 3 (Western Region)**

<b>WESTERN REGION AD-ROUTES</b>				
<b>Route Number (E or AD)</b>	<b>Start Point</b>	<b>End Point</b>	<b>Total Distance (km)</b>	<b>Remarks</b>
AD301	(See Table 2)			
AD302	E11 (west of Al Silah)	E11(southeast of Al Silah)	10.7	
AD304	Al Hamra Airport	AD307 - west of Bid A' Matavah	38	Future extension past Umm Al Ishtan not included in distance
AD306	AD308 - Jct (Dalma centre)	AD308 - Dalma Island north end	11	Delma island
AD307	AD304 - west of Bid A'Matavah	AD310- North of Ghayathi	37	
AD308	Ferry terminal	AD306 - Dalma Island north end	9.5	Delma Island Section
AD308	Ferry terminal - Jebel Dhanna	Ferry terminal - Dalma Island	40	Ferry Section (estimated nautical distance)
AD308	E11 - Jebel Dhanna	Ferry terminal - Jebel Dhanna	21	Mainland Section
AD310	(See Table 2)			
AD315	(See Table 2)			
AD319	AD376	AD378	9	Connects two parallel routes to Al Dabiya
AD321	E11 - Al Mirfa (west)	E11 - Al Mirfa (east)	34	
AD324	Fountain R/A, Al Mirfa	E11 - Al Mirfa	5.5	
AD328	AD310 - North of Liwa	AD342 - Habshan	79	Existing road ends at Bu Hasa (future extension is 33 km of total)
AD331	AD350-Madinat Zayed	AD372-Al Zafrah	57	

WESTERN REGION AD-ROUTES				
Route Number (E or AD)	Start Point	End Point	Total Distance (km)	Remarks
AD342	E11 - Tarif	Jct AD342/350- Madinat Zayed (north)	40	
AD344	Tarif (R/A)	E11 - Tarif	5	
AD358	AD250 north of Madinat Zayed	AD331- Madinat Zayed	7	
AD350	(See Table 2)			
AD358	E11 (Tarif East)	Bu Lifiyat	29	Connects Bu Lifiyat and Al Jirab (via AD358) to E11
AD367	AD395 - West of Qatuf	Jct AD395/AD366- Marwan Town	18	
AD372	AD380 - Suhil	E11 (Current), Al Dabiya (future)	75	Section north of E11 is future route to Al Dabiya (estimated 12 km)
AD374	Al Dabiya Oil Operation	E11	22	
AD376	Ras Dubiyah	AD374	14	
AD378	Ras Dubiyah	E11	26	
AD380	(See Table 2)			
AD395	(See Table 2)			
AD399	Saudi Border (turnaround)	AD395/AD310 Junction (Al Arada)	23	

### 5.2.4 Co-signing of M-Routes

Figure 17 shows the cosigning of M-routes with E-routes and proposed AD-routes, based on the route definitions presented in Chapter 3, for route M5 (cosigned with route E11), M7 (cosigned with route E22 outside Al Ain, and with AD245 within Al Ain and east to the Az Zarub border crossing). Route M9 is relatively short, travelling from Al Ain centre (junction with M7) to the Nizwa crossing, cosigned with route AD298.



**Figure 17: Mashreq Routes in Abu Dhabi (cosigning with E-Routes and AD-Routes)**

## **APPENDIX A: FORMS FOR REQUESTING, REASSIGNING, OR DELISTING ROUTE NUMBERS**

**Appendix A: Forms for Requesting, Reassigning, or Delisting Route Numbers**

The following pages contain the Route Numbering Request and Modification (RNRAM) form to be used for documenting route numbering requests for submittal to DoT's Committee on Route Numbering and, for E-route-related actions, the Federal Transport Authority. The procedures for using the form to request different route numbering actions are detailed below for AD-route assignments, E-route assignments, reassigning route numbers to different facilities, and delisting current route numbers from a facility.

**AD-Route Procedures**

1. Identify Route Numbering Action. Select "Establish Permanent AD-route Number" from the choices listed in item #1 of the form. Identify if it is a "New Request" or "Resubmittal" of an earlier request.
2. Identify Route Termini and Length. In item #2 of the form, identify the town, city, or route (E-route or AD-route) at which the road originates (typically west or south terminus) and where it ends (typically east or north terminus), and the total length in kilometres. If the kilometre posting along the route is to be tied to a location not on the actual route, DoT should specifically identify that junction and the distance to the physical origin of the route.
3. Show Route Map. Within the blank space on the second page of the RNRAM form, insert a map showing the path of the route and control points, including termini (refer to paragraph 2 above), intermediate route numbers being crossed, and the towns through which the road travels or which are bypassed by the road. Indicate which sections of the road are new and which are existing, as well as the portions of the road that are currently single carriageway, dual carriageway, and limited/controlled access, following the colour codes and symbology provided on the form. Show the distances along the segments between termini, intermediate road crossings, and the centre of towns either being intersected or bypassed.
4. Describe Whether Facility is Existing, is New, or Has New Segments. In Item #3, identify if this is an "Existing road facility with no route number", a "New facility", or contains "Both existing and new segments". If "New facility" or "Both existing and new segments" is selected, identify the estimated month and year that the new facilities will be open to traffic. To reserve route numbers for future roads not yet under construction, indicate the route is a "New facility" and indicate the date as being the future month and year that the road is forecast to be open for traffic.
5. Describe and Justify Route Numbering Action. In Item #4, describe the explanation and reasons for the request, citing the appropriate references in Chapter 3 to route facility selection and numbering principles, as well as the route numbering scheme presented in Chapter 5 of this Manual. Any exceptions shall be clearly stated and justifications provided.
6. Describe Route Number Replacement and Justification. Item #5 allows the user to show if the routing is to replace an existing E-route or AD-route number, and between which locations as referenced on the map as identified in subparagraph (c) above. Letter references to roadway segments where existing route numbers are being replaced shall be provided on the map and referenced within the response to Item #5. Please provide an explanation and justification for the existing route number replacement, referencing the principles and criteria of Chapter 3 and the route numbering scheme presented in Chapter 5 of this Manual. Any other criteria not reflected in this Manual shall be clearly stated and justifications provided. (Note – if an E-route is proposed to be replaced with an AD number, it shall go through the FTA approval process as referenced in Paragraphs 12, 13, and 14 below).

7. Co-Numbering. Item #6 establishes if the routing is to be co-numbered with another AD-route, E-route, or M-route for a portion of its route, and if this will be a “permanent” or “temporary” co-numbering. If temporary, identify the year the co-numbering will be eliminated (e.g., due to a new road segment). Letter references to roadway segments where routes are being co-numbered shall be provided on the map and referenced within the response to Item #6. Please provide an explanation and justification for the route co-numbering. In the case of M-routes, these have been established previously through UNESCWA and GCC and justification is not required.
8. Average Daily Traffic. Item #7 requires the user to estimate the average daily traffic volume along the entire proposed route and provide reference data for this estimate for each of the next future years ending in “5” and “0”.
9. Agency Completion and Signatures. Under Item #8, all forms shall be completed under the supervision and signature of the Executive Director of Roads if from DoT, or for routes within Municipalities, from the executive head of roads facilities for the respective Municipalities or the public road operator. If a route is, at various points, part of multiple jurisdictions, all of the jurisdictions shall be represented on the form signature page.
10. Detailed Supplementary Information is provided as an attachment to the RNRAM form, in the form of a table, and shall be completed to the best knowledge of the user (i.e. assigning routes to future road corridors may mean all deficiencies of the facility are not yet known). The supplementary information is listed by columns and includes the following:
  - a. Column 1 shows kilometre posts at termini and control points as shown on the map on sheet 2 of the RNRAM form. Show for both existing portions of the route as well as new or not-yet-constructed portions of the route.
  - b. Column 2 shows the name of the control point.
  - c. Column 3 shows the average daily traffic estimates between control points based on referenced volume data for the next year ending in “5” or “0”, whichever is nearest.
  - d. Column 4 identifies whether the road is single or dual carriageway between the specific control points.
  - e. Column 5 indicates the number of lanes between the specific control points in each direction (show number followed by the letter N for northbound, S for southbound, E for eastbound, and W for westbound).
  - f. Column 6 indicates if the road is currently lighted.
  - g. Column 7 indicates if the road is scheduled to be widened (W) or replaced (R) within 5 years of the RNRAM submission.
11. Summary Page. On the last page of the document, a checklist relative to AD-route criteria as per Sections 3.5.1 and 3.5.2 is to be completed, based on the information provided in the prior steps.
12. Committee Review Form. The RNRAM form shall be reviewed by the Committee on Route Numbering and a Committee Review Form is completed, referencing the specific RNRAM (form is referenced by E or AD route number and date). Space is reserved for the DoT Committee on Route Numbering to review and provide comments on the RNRAM submittal, and offer its recommendation to the submitter.
13. Authorization to Apply AD-Route Numbering Signage. At the end of the Committee Review Form, a signature by the chairman of the DoT Committee on Route Numbering with the word “Approved” checked next to the signature shall be required at the end of the form in order for DoT, Municipalities, or other public road operators to implement AD-route number signing and to authorize government and private map developers to utilize the route number information on

any maps available to the public. If the phrase “Not Approved” is provided next to the committee chairman’s signature, the DoT, Municipalities, or other public road operators shall be required to correct (based on the review response) the deficiencies identified in the RNRAM submittal before it can be resubmitted. The third choice (“Concur, Forward to FTA”) is only used for E-route requests (including assigning new E-routes or delisting/replacing existing E-routes).

14. FTA Involvement. The “FTA Supplemental Sheet” shall not be required for AD-route numbering approvals unless it involves the delisting of an existing E-route, in which case the application shall be forwarded to FTA as would an E-route Number Request as described below.

### **E-Route Procedures**

1. Identify Route Numbering Action. Select “Establish Permanent E-route Number” from the choices listed in item #1 of the form. Identify if it is a “New Request” or “Resubmittal” of an earlier request.
2. Route Termini and Length. In item #2 of the form, Identify the town, city, or route (E-route or AD-route) at which the road originates (typically west or south terminus or Emirate/international boundary) and where it ends (typically east or north terminus or Emirate/international boundary), and the total length in kilometres. If the kilometre posting along the route is to be tied to a location not on the actual route, DoT should specifically identify that junction and the distance to the physical origin of the route.
3. Route Map. Insert map as per the requirements of The AD-route procedures, paragraph 3.
4. Major Information. Complete Items #3 through #8 similar to the AD-route form process in the AD-route procedures, paragraphs 4 through 9.
5. Detailed Supplementary Information is to be completed similar to the AD-route format in the AD-route procedures, paragraph 10.
6. Summary Page. On the last page of the document, a checklist relative to E-route criteria as per Sections 3.4.1 and 3.4.2 is to be completed, based on the information provided in the prior steps.
7. Agency Completion and Signatures. Under Item #8, all forms shall be completed under the supervision and signature of the Executive Director of Roads if from DoT, or for routes within Municipalities, from the executive head of roads facilities for the respective Municipalities or the public road operator. If a route is, at various points, part of multiple jurisdictions, all of the jurisdictions shall be represented on the form signature page.
8. Detailed Supplementary Information for the proposed E-route is provided as an attachment to the RNRAM form, in the form of a table, and shall be completed to the best knowledge of the user (i.e. assigning routes to future road corridors may mean all deficiencies of the facility are not yet known). The supplementary information shall be inserted as per the AD-route procedures, Paragraph 10.
9. Summary Page. On the last page of the document, a checklist relative to E-route criteria as per Sections 3.5.1 and 3.5.2 is to be completed, based on the information provided in the prior steps.
10. Committee Review Form. The RNRAM form shall be reviewed by the Committee on Route Numbering and a Committee Review Form is completed, referencing the specific RNRAM (form is referenced by E or AD route number and date). Space is reserved for the DoT Committee on Route Numbering to review and provide comments on the RNRAM submittal, and offer its recommendation to the submitter.
11. Authorization to Forward Proposed E-Route Numbering Action. At the end of the Committee Review Form, a signature by the chairman of the DoT Committee on Route Numbering with the

choice “Concur, Forward to FTA” checked next to the signature shall be required at the end of the form in order to forward the E-route numbering request to FTA. If the phrase “Not Approved” is provided next to the committee chairman’s signature, the DoT, Municipalities, or other public road operators shall be required to correct (based on the review response) the deficiencies identified in the RNRAM submittal before it can be resubmitted.

12. FTA Involvement and Signatures. The “FTA Supplemental Sheet” shall be required for E-route Number Requests. The Requestor (DoT, Municipality, road operator) shall provide a 2 to 3 paragraph description of the routing or rerouting strategy and explain the justification for assigning an E-route number to the route, including location, basis for numbering, adherence to the Chapter 3 route numbering criteria, etc. FTA shall review the full RNRAM that is forwarded by DoT, and identify at the bottom of the Supplemental Sheet the final decision (approved, not approved) made by FTA’s Executive Director or his authorized deputy.
13. If Not Approved. If the phrase “Not Approved” is provided next to the committee chairman’s signature, the DoT, Municipalities, or other public road operators shall be required to correct (based on the review response) the deficiencies identified in the RNRAM submittal for the E-route before it can be resubmitted to DoT’s Committee and Route Numbering and ultimately, the FTA.

#### Procedures for Reassigning Route Numbers to Different Facilities

1. Action for Reassigning Existing Route Number. Requests to reassign an existing route number under Item #1 of the RNRAM form shall require the choice of “Reassign Existing Route Number to Another Facility”.
2. Identify Route Termini and Length. In item #2, Identify the town, city or route (E-route or AD-route) at which the road originates (typically west or north terminus) and where it ends (typically east or south terminus), and the total length in kilometres. If the kilometre posting along the route is to be tied to a location not on the actual route, DoT should specifically identify that junction and the distance to the physical origin of the route.
3. Show Route Map. Two maps shall be provided within the blank space on the second page of the RNRAM form: (1) an overall Emirate map or regional map (depending on route location) showing the location of the old assigned route for the route number and the proposed new route, and (2) a map showing the path of the new route for the specified route number, along with control points, including termini (refer to paragraph 2 above), intermediate route numbers being crossed, and the towns through which the road travels or which are bypassed by the road. Indicate which sections of the road are new and which are existing, as well as the portions of the road that are currently single carriageway, dual carriageway, and limited/controlled access, following the colour codes and symbology provided on the form. Show the distances along the segments between termini, intermediate road crossings, and the centre of towns either being intersected or bypassed.
4. Describe Whether Facility is Existing, is New, or Has New Segments. Complete Item #3 as per paragraph 4 of the AD-route procedures above.
5. Describe and Justify Route Numbering Action. Item #4 shall demonstrate that the proposed route relocation will be to a facility that is consistent with the route numbering principles identified in Section 3 for E-routes or AD-routes, whichever is applicable.
6. In Item #5, describe the explanation and reasons for the relocation of the existing route number, including but not limited to the following criteria:

- a. Construction of Replacement Facility. If a new facility or road parallel to an older road has been constructed and is replacing the old route as the primary main road in the region or zone.
  - b. Relocation of number to another facility elsewhere in the Emirate. If an existing route number is located such that it is not consistent with the route numbering principles of Chapter 3 or the numbering schemes identified in Chapter 5, and is instead recommended to be implemented on another facility. Any exceptions shall be clearly stated and justifications provided.
7. Remainder of the RNRAM shall be completed consistent with the requirements of for AD-routes and E-routes
  8. If the route number relocation is accompanied by a replacement with another route number that should be addressed in item #5 of the RNRAM consistent with the procedures shown for AD-routes and E-routes.

#### Procedure for Delisting Route Numbers

Item #1 on the RNRAM allows the selection of a desired action to delist the route number. However, the other items showing the current route, termini, and control points should be shown in order to illustrate the current route status. Item #4 should specifically identify why the route number is being delisted, and should demonstrate that the current route does not meet the route numbering principles stated in Chapter 3 of this Manual. The Summary Page at the end of the RNRAM should clearly show in the checklist that the route does not meet AD-route or E-route criteria.



## ROUTE NUMBER REQUEST AND MODIFICATION FORM

Name of Requestor: \_\_\_\_\_

Requesting Agency/Department: \_\_\_\_\_

### 1. IDENTIFY ROUTE NUMBERING ACTION

(A) Check one of the following actions.

Establish Permanent AD-Route Number <input type="checkbox"/>	Establish Permanent E-Route Number <input type="checkbox"/>	Reassign Existing Route Number to Another Facility <input type="checkbox"/>	Replace Current Route Number with New Route Number <input type="checkbox"/>	Delist Current Route Number <input type="checkbox"/>
---	--	--	--	---

(B) Is this a new request or a resubmittal of an old request?

New Request <input type="checkbox"/>	Resubmittal <input type="checkbox"/> Route Number: _____ Date: _____
--------------------------------------	--

### 2. IDENTIFY ROUTE TERMINI AND LENGTH

(A) Please identify the proposed route number (E-route or A-route) to be assigned to the route below.

(B) Identify in the space below the town, city, or route (E-route or AD-route) at which the road originates.








(C) Identify in the space below the town, city, or route (E-route or AD-route) at which the road ends.

(D) Identify the total length of the route.








\_\_\_\_\_ kilometres

(E) Insert route map on the following page. Include the path of the route and control points (including termini), intermediate route numbers being crossed, and the towns through which the road travels or which are bypassed by the road. Indicate which sections of the road are new and which are existing (with street names where applicable), as well as the portions of the road that are currently single carriageway, dual carriageway, and limited/controlled access, following the colour codes and symbology provided below. Show the distances along the segments between termini, intermediate road crossings, and the centre of towns either being intersected or bypassed.

#### Single Carriageway

	Existing road section
	New road section
	Town/Control point
	Crossing route
	AD-route number
	E-route number
	Distance (km) between control points

#### Dual Carriageway

	Existing road section
	New road section
	Town/Control point
	Crossing route
	AD-route number
	E-route number
	Distance (km) between control points

Insert map below following the criteria outlined in Item 2(E).

3. DESCRIBE FACILITY			
(A) Classify the facility as one of the following.			
Existing road facility with no route number <input type="checkbox"/>	New facility <input type="checkbox"/>	Both existing and new segments <input type="checkbox"/>	Existing road with existing route number <input type="checkbox"/>
(B) If you checked "New facility" or "Both existing and new segments", identify the estimated month and year that the new facilities will be open to traffic. If you selected "New facility" and would like to reserve route numbers for future roads not yet under construction, indicate the date as being the future month and year that the road is forecast to be open for traffic.			
____/____ (mm/yyyy)			

4. REASON FOR REQUEST
<p>(A) <i>Justify this request and cite the appropriate references in accordance with the principles and criteria found in the Route Numbering System Manual for the Abu Dhabi Emirate. Please cite specific Manual sections. Any other criteria not reflected in the Manual shall be clearly stated and justifications provided.</i></p>

5. DESCRIBE ROUTE NUMBER REPLACEMENT AND JUSTIFICATION
<p>(A) <i>If you selected either "Replace Current Route Number with New Route Number" or "Reassign Existing Route Number to Another Facility" in Item 1(A), provide an explanation and justification for the existing route number replacement, referencing the principles and criteria of Chapter 3 and the route numbering scheme presented in Chapter 5 of the Route Numbering System Manual for the Abu Dhabi Emirate. Please cite specific sections or maps in your explanation. Any other criteria not reflected in the Manual shall be clearly stated and justifications provided.</i></p>

<b>6. IDENTIFY CO-NUMBERING</b>	
(A) If the routing is to be co-numbered with another AD-route, E-route, or M-route for a portion of its route, select one of the following.	
Permanent Co-Numbering <input type="checkbox"/>	Temporary Co-Numbering <input type="checkbox"/>
(B) If you selected "Temporary Co-Numbering", identify the year the co-numbering will be eliminated.	
_____ (yyyy)	
(C) Provide an explanation and justification for the route co-numbering (only for AD-routes and E-routes). Note: M-routes have been established previously through UNESCWA and GCC and justification is not required.	

<b>7. ESTIMATED AVERAGE DAILY TRAFFIC</b>
(A) Estimate the average daily traffic volume along the entire proposed route and provide reference data for this estimate for each of the next future years ending in "5" and "0".
Year: _____
Estimated ADT: _____
Year: _____
Estimated ADT: _____

## 8. AGENCY COMPLETION AND SIGNATURES

(A) Sign below to confirm that this form has been completed under the supervision of the Executive Director of Roads (if from DoT), or the executive head of roads facilities or the public road operator (if for routes within Municipalities). For routes that are part of multiple jurisdictions, all of the jurisdictions shall be represented below.

### DETAILED SUPPLEMENTARY INFORMATION

Please complete the following table to the best of your knowledge. \*

Signature: \_\_\_\_\_

Printed Name: \_\_\_\_\_

Title: \_\_\_\_\_

Jurisdiction: \_\_\_\_\_

(B) If applicable, please obtain signatures from any additional jurisdictions.

Signature: \_\_\_\_\_

Printed Name: \_\_\_\_\_

Title: \_\_\_\_\_

Jurisdiction: \_\_\_\_\_

Signature: \_\_\_\_\_

Printed Name: \_\_\_\_\_

Title: \_\_\_\_\_

Jurisdiction: \_\_\_\_\_

Signature: \_\_\_\_\_

Printed Name: \_\_\_\_\_

Title: \_\_\_\_\_

Jurisdiction: \_\_\_\_\_

Signature: \_\_\_\_\_

Printed Name: \_\_\_\_\_

Title: \_\_\_\_\_

Jurisdiction: \_\_\_\_\_

Signature: \_\_\_\_\_

Printed Name: \_\_\_\_\_

Title: \_\_\_\_\_

Jurisdiction: \_\_\_\_\_

Signature: \_\_\_\_\_

Printed Name: \_\_\_\_\_

Title: \_\_\_\_\_

Jurisdiction: \_\_\_\_\_

[illegible]

<sup>4</sup> Indicate "N/A" if the road is not scheduled to be widened or replaced within 5 years of the RNRAM form submission.

Route No. \_\_\_\_\_ Date \_\_\_\_\_

# SUMMARY PAGE

*Please complete the following checklist depending on whether your request pertains to an E-route or AD-route number.*

## E-Route Criteria

- ☐ Provides Through Travel between Emirates or international crossings
- ☐ 150 m minimum right-of-way width to accommodate dual carriageway facilities (100 m in urban areas)
- ☐ Limited-access (i.e., expressway) or controlled-access (i.e. freeway)
- ☐ No signalized at-grade junctions
- ☐ No signalized at-grade junctions or roundabouts
- ☐ Speed limit of 100 km/h or higher (80 km/h in urban areas)

## AD-Route Criteria

- ☐ Route of regional significance connecting key destinations, settlements and transportation terminals of Emirate-wide importance
- ☐ Connects to AD-route or E-route on both ends of the route, except for government, educational, ports or transportation intermodal facilities where one terminus is an AD-route or E-route and the other is the facility.
- ☐ Does not dead end within a local neighbourhood or rural zone with no direct connectivity to other numbered routes, without a clear turnaround location
- ☐ Speed limit of 60 km/h or higher

## THIS PAGE TO BE COMPLETED BY THE DOT COMMITTEE FOR ROUTE NUMBERING

<b>COMMITTEE REVIEW COMMENTS</b>		Route No. _____ Date _____
<i>Please provide comments on the RNRAM submittal and offer a recommendation to the submitter..</i>		
<i>Please provide below a determination followed by the signature of the chairman of the DoT Committee on Route Numbering.</i>		
Approved <input type="checkbox"/>	Concur. Request forwarded to FTA (E-routes) <input type="checkbox"/>	Not Approved <input type="checkbox"/>
<p>Signature: _____</p> <p>Printed Name: _____</p> <p>Title: _____</p>		



Route No. \_\_\_\_\_ Date \_\_\_\_\_

## E-ROUTE ACTION APPROVAL FORM FOR FEDERAL TRANSPORT AUTHORITY

### SPACE BELOW TO BE COMPLETED BY REQUESTOR.

*Please provide a two to three paragraph description of the routing/rerouting strategy and explain your justification for assigning/removing an E-route number from the subject route, based on location, numbering basis and criteria as presented in the Route Numbering System Manual for the Abu Dhabi Emirate.*

### SPACE BELOW TO BE COMPLETED BY FTA.

*Please provide comments.*

*Please provide below a determination followed by the authorized executive signature for FTA.*

Approved (see comments above)

☐

Please Resubmit (see comments above)

☐

Rejected (do not resubmit) ☐

Signature: \_\_\_\_\_

Printed Name: \_\_\_\_\_

Title: \_\_\_\_\_



## APPENDIX B: MAPS

**Appendix B.1** includes maps for Zone 1 (Central Region) divided into specific sections with larger concentration of numbered routes.

**Appendix B.2** provides maps for Zone 2 (Eastern Region), again divided into specific geographic sections.

**Appendix B.3** provides maps for Zone 3 (Western Region) divided into geographic sections and more detailed local maps in order to show higher concentrations of routes.

All maps included in this Appendix are not to scale.

## **APPENDIX B.1: ZONE 1 (CENTRAL REGION) ROUTE NUMBERING MAPS**

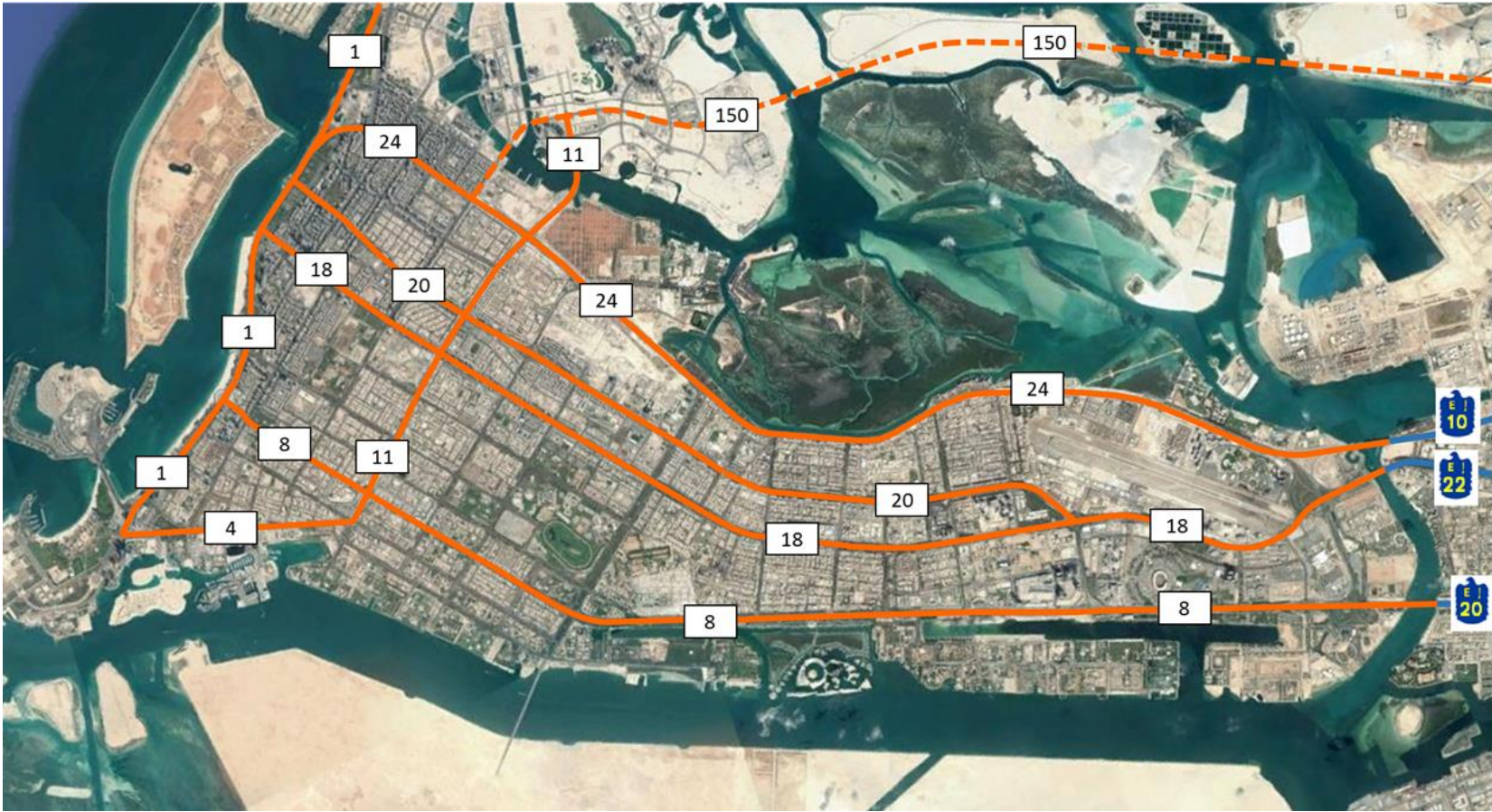


Figure 18: RNZ 1 (Central Region), Abu Dhabi Island Section

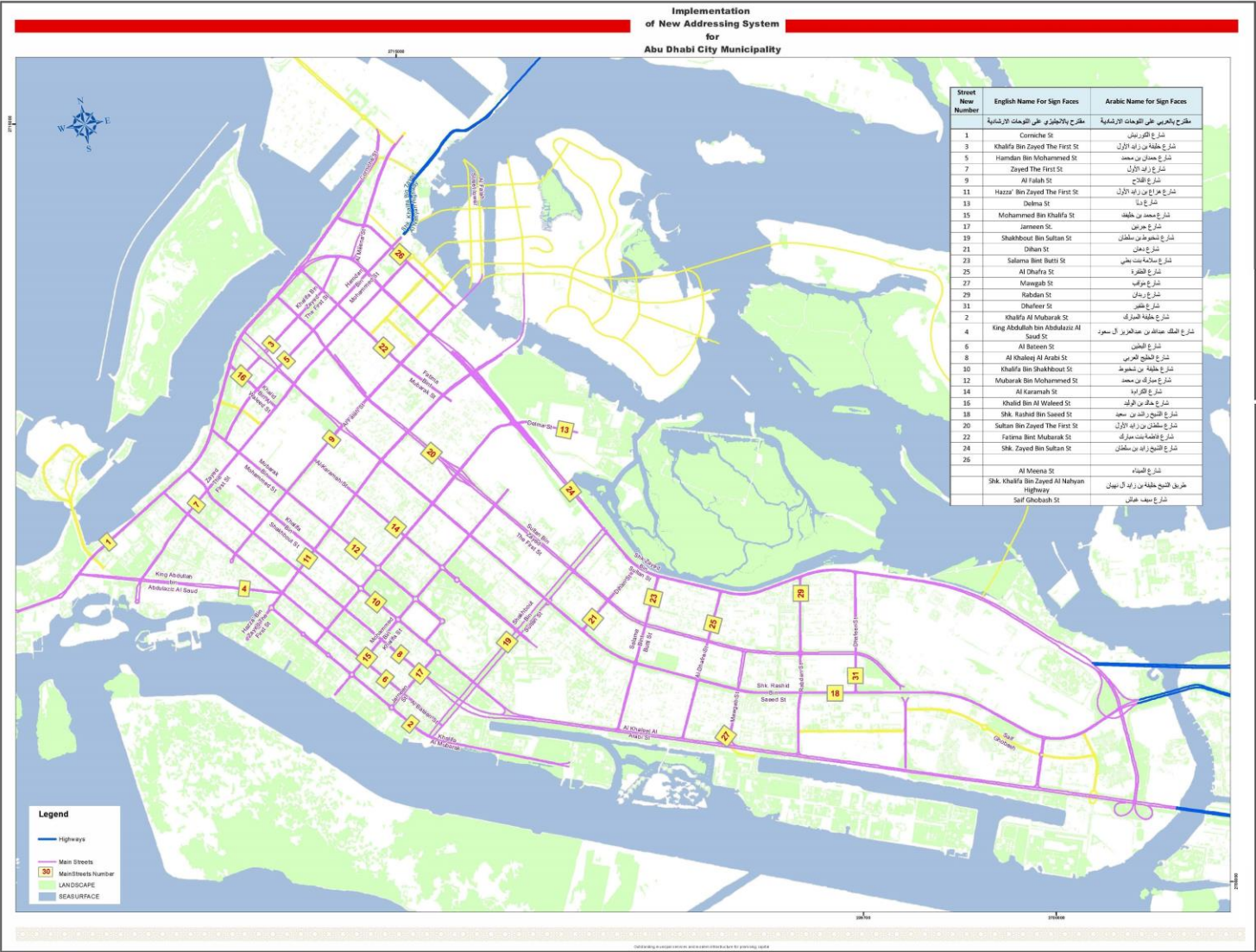


Figure 19: RNZ 1 (Central Region), Abu Dhabi Island Section - Main Streets Abu Dhabi City with Numbering





Figure 20: RNZ 1 (Central Region), Saadiyat Section



Figure 21: RNZ 1 (Central Region), Yas Area





Figure 22: RNZ 1 (Central Region), south mainland area





Figure 23: RNZ 1 (Central Region), Central Mainland Area



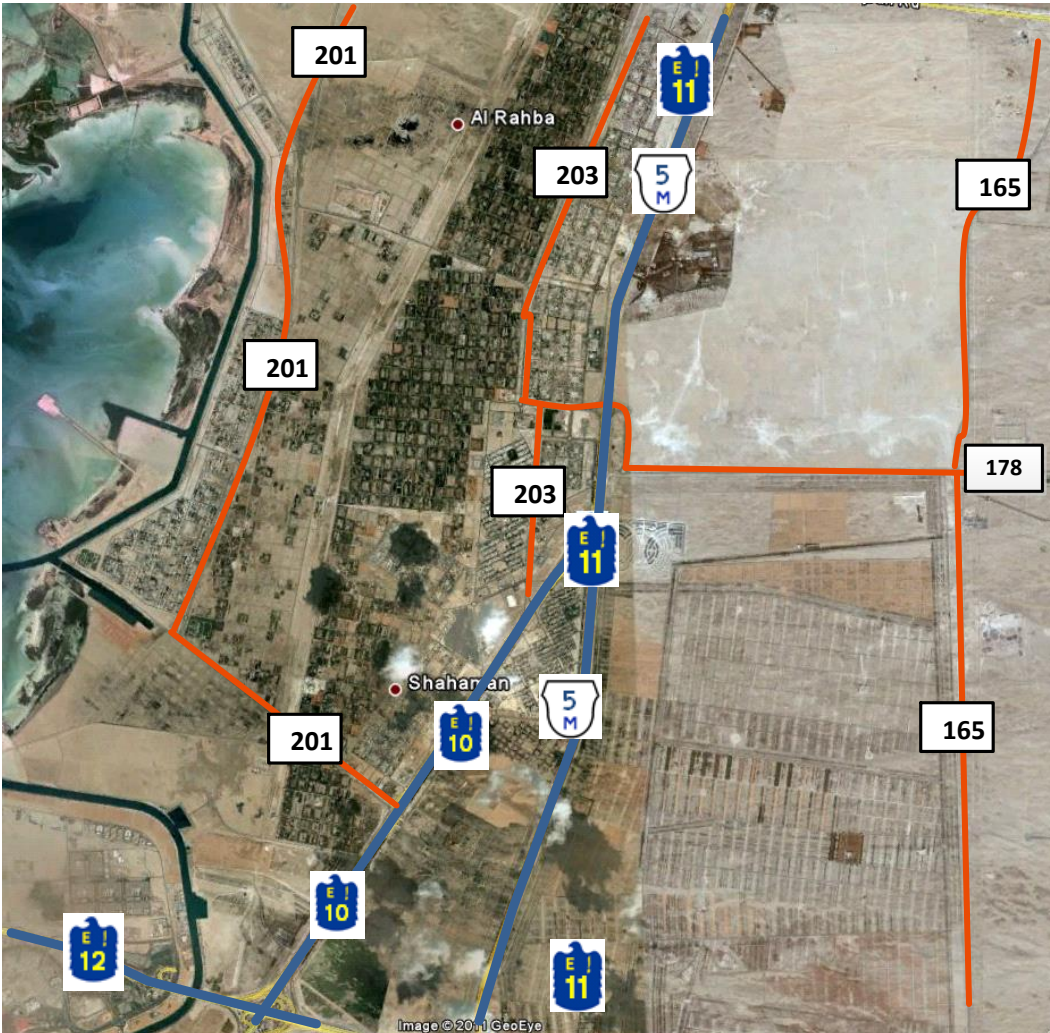


Figure 24: RNZ 1 (Central Region), North Mainland Area

## **APPENDIX B.2: ZONE 2 (EASTERN REGION) ROUTE NUMBERING MAPS**

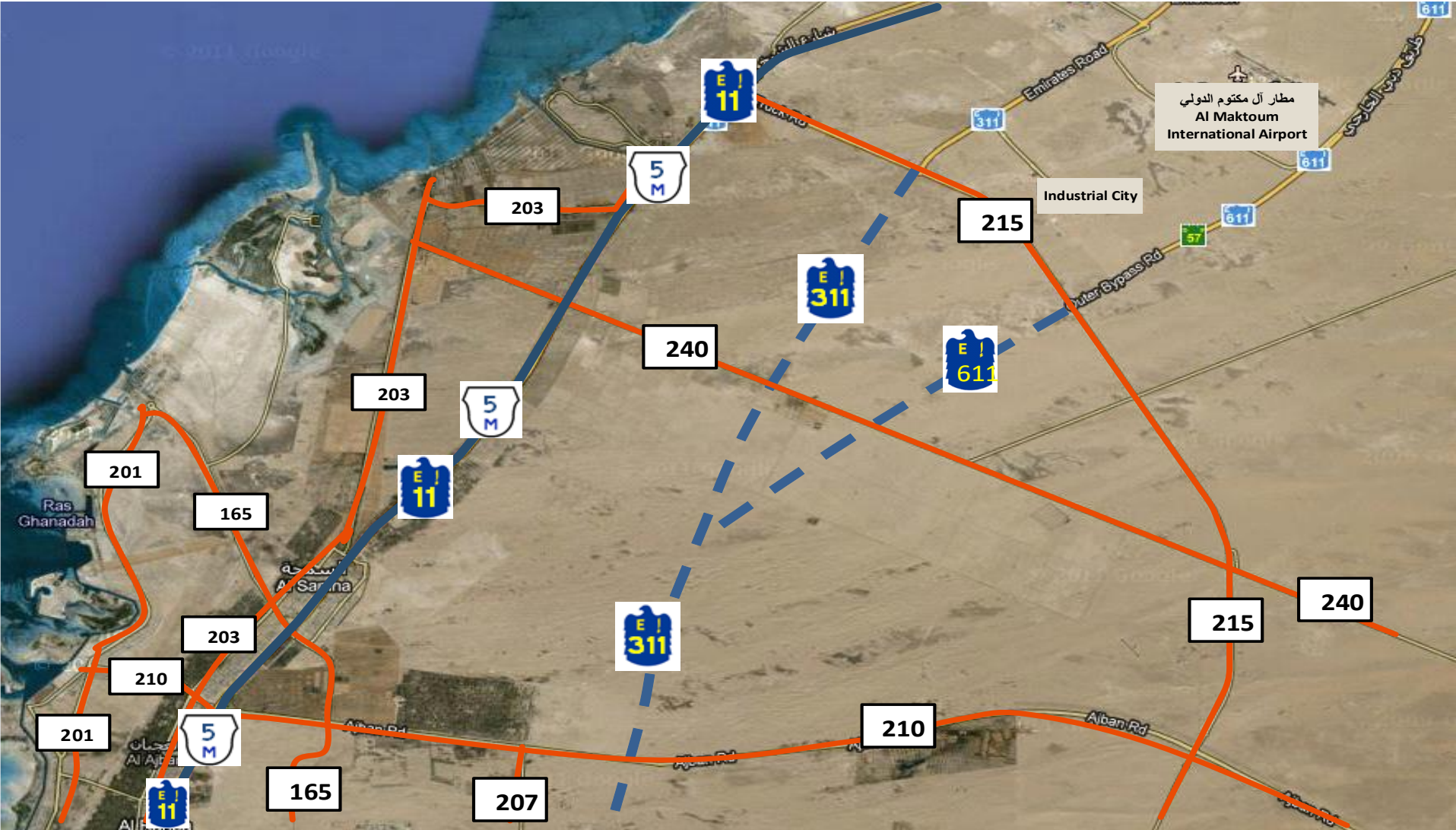
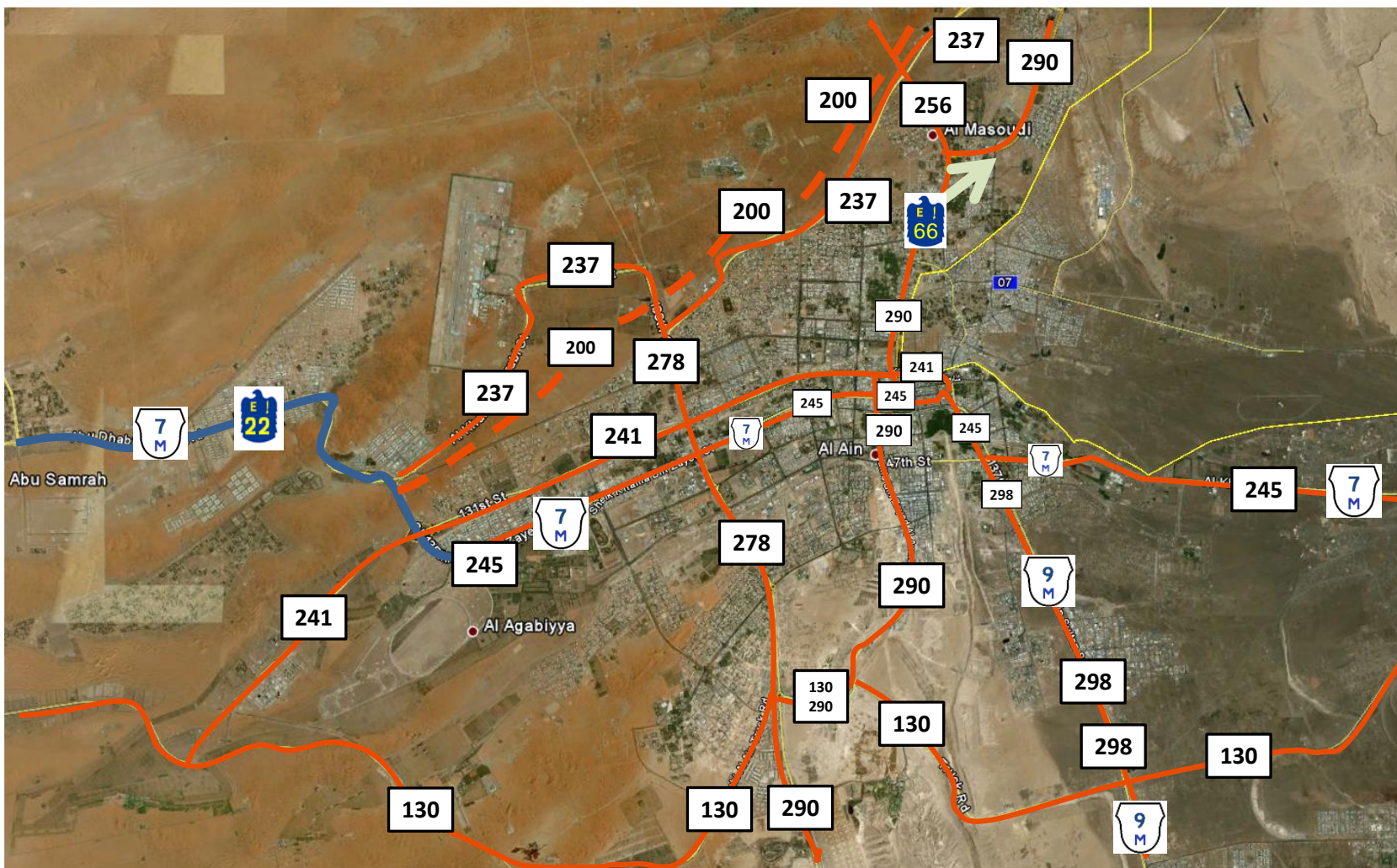


Figure 25: RNZ 2 (Eastern Region), Northern Section







**Figure 27: RNZ 2 (Eastern Region), Al-Ain Section**



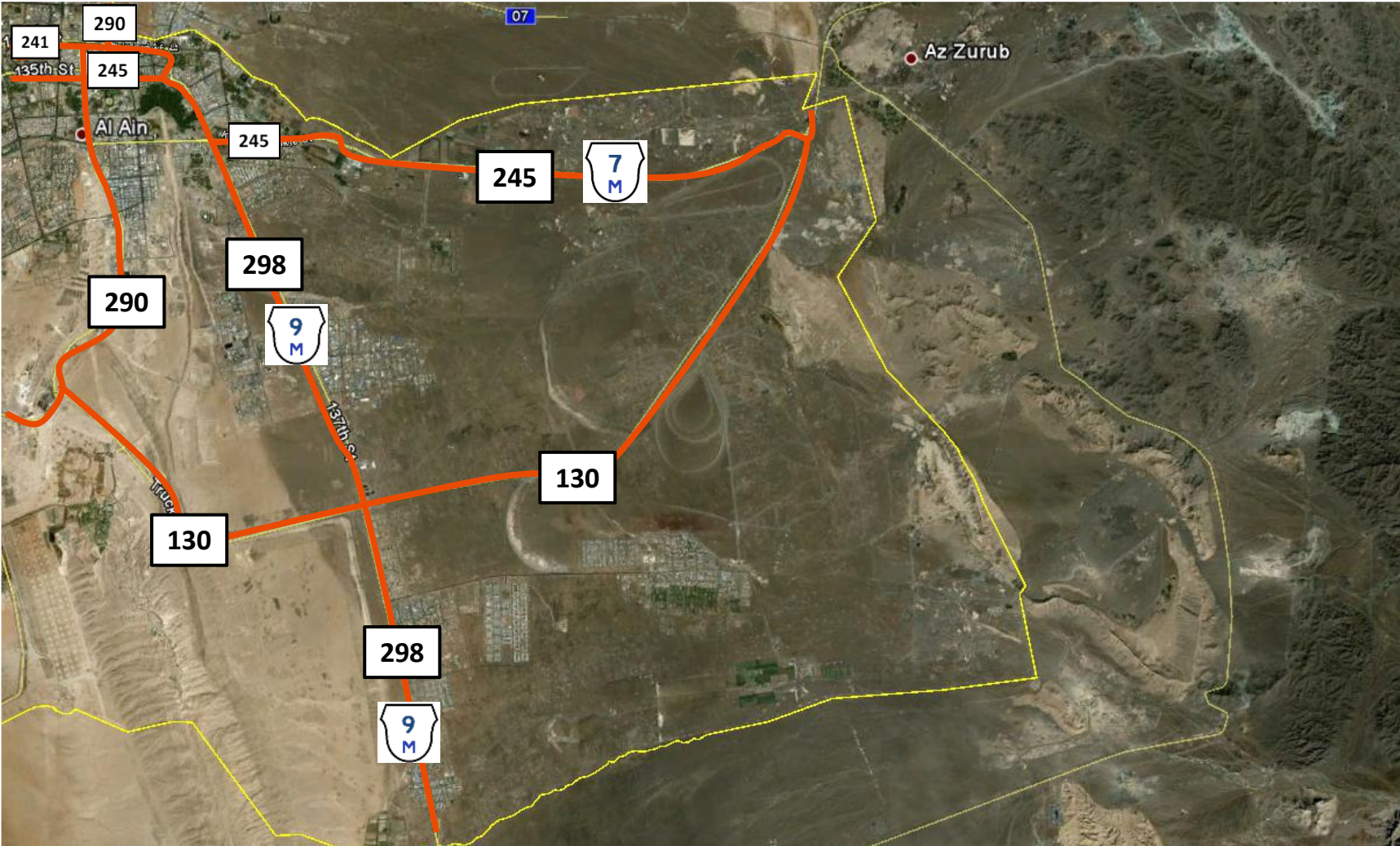
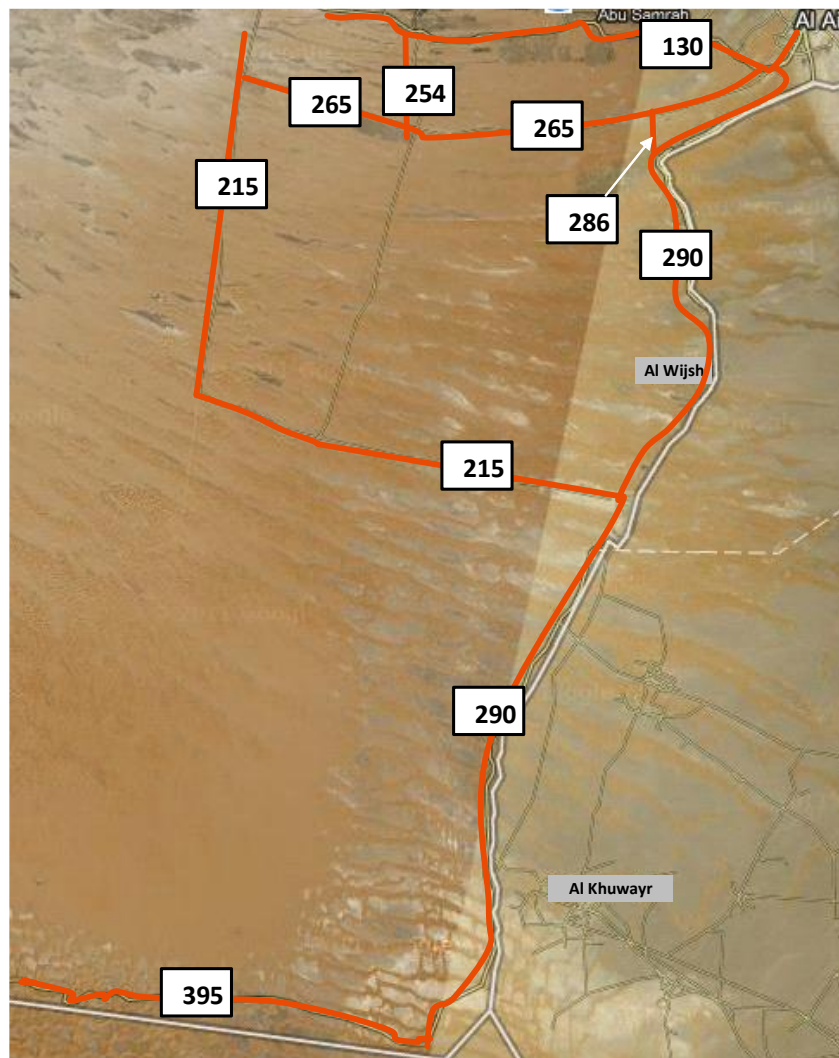


Figure 28: RNZ 2 (Eastern Region), Al-Ain / Omani Border Section



**Figure 29: RNZ 2 (Eastern Region), Southern Section**

## **APPENDIX B.3: ZONE 3 (WESTERN REGION) ROUTE NUMBERING MAPS**



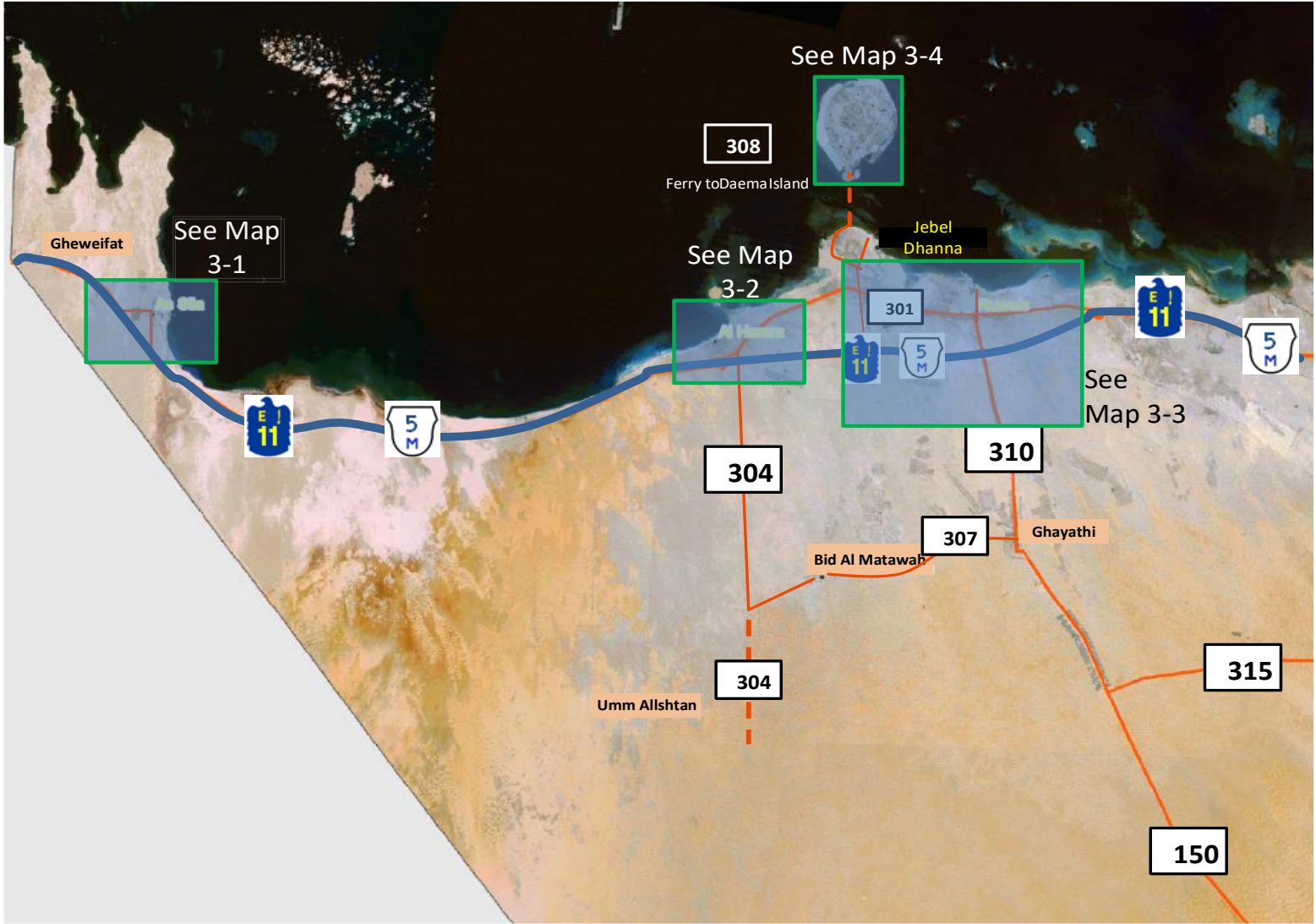


Figure 30: RNZ 3 (Western Region), Northwest Section

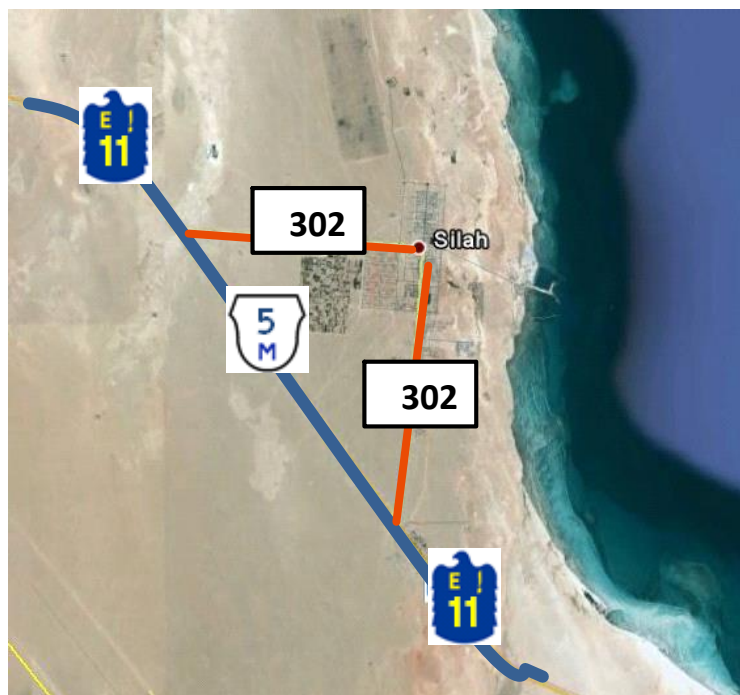


Figure 31: Western Region, Northwest Section, Map 3-1 (Al silah) and Map 3-2 (Al Hamra)





Figure 32: Western Region, Northwest Section, Map 3-3 (Jebel Dhanna / Al Ruwais)

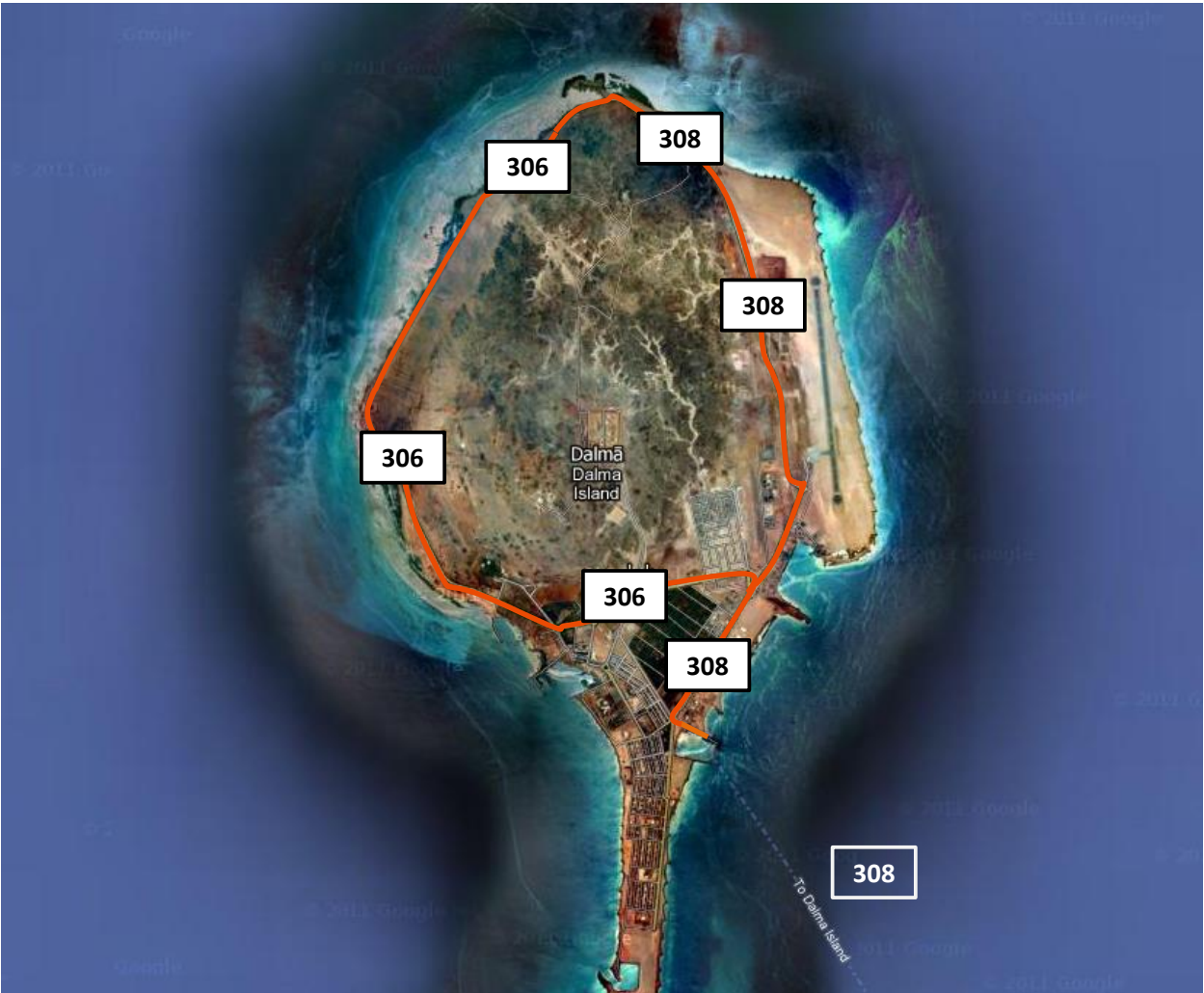


Figure 33: Western Region, Northwest Section, Map 3-4 (Delma Island)



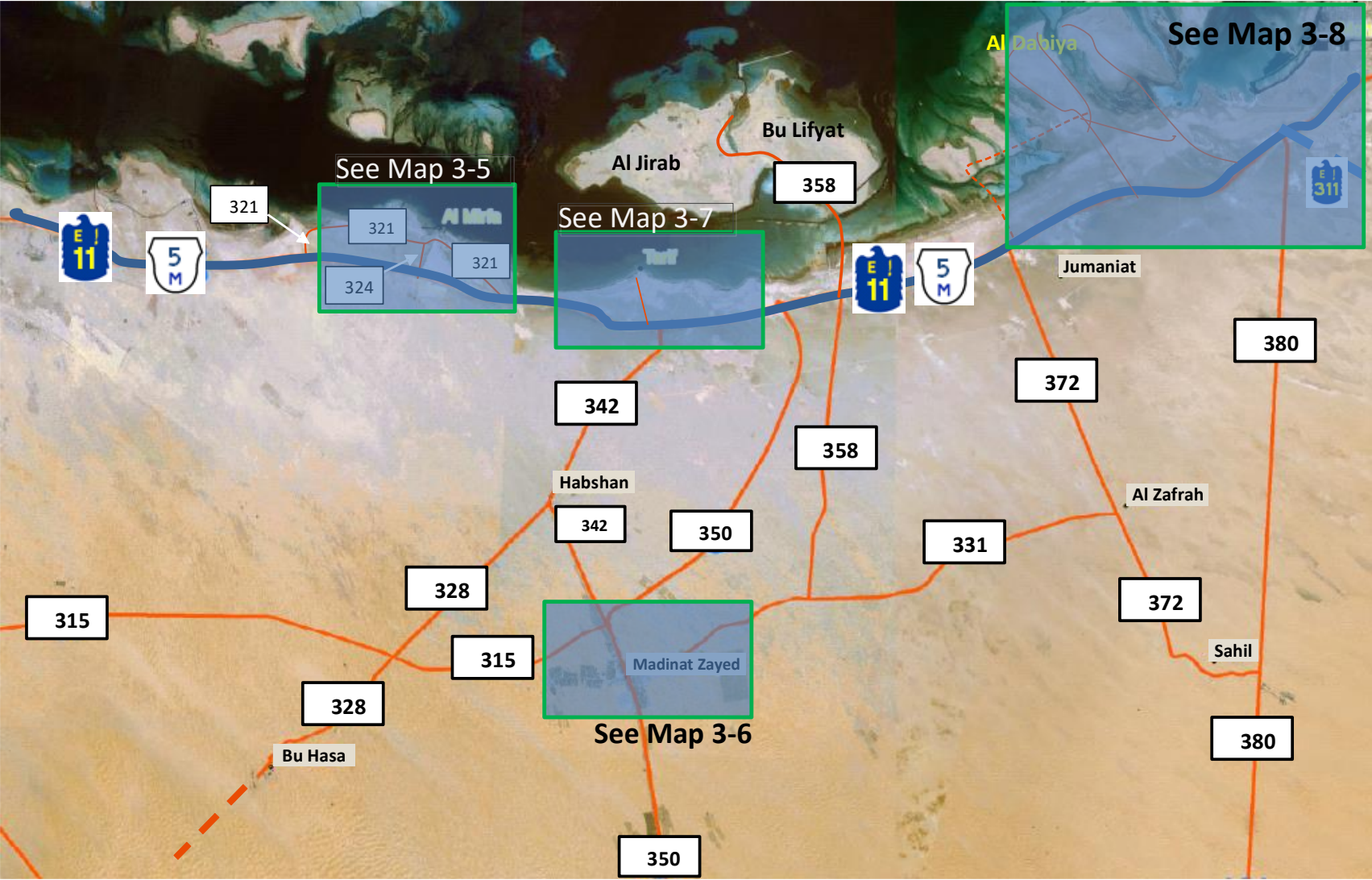


Figure 34: RNZ 3 (Western Region), North Central Section



Figure 35: RNZ 3 (Western Region), North Central Section, Map 3-5 (Al Mirfa)



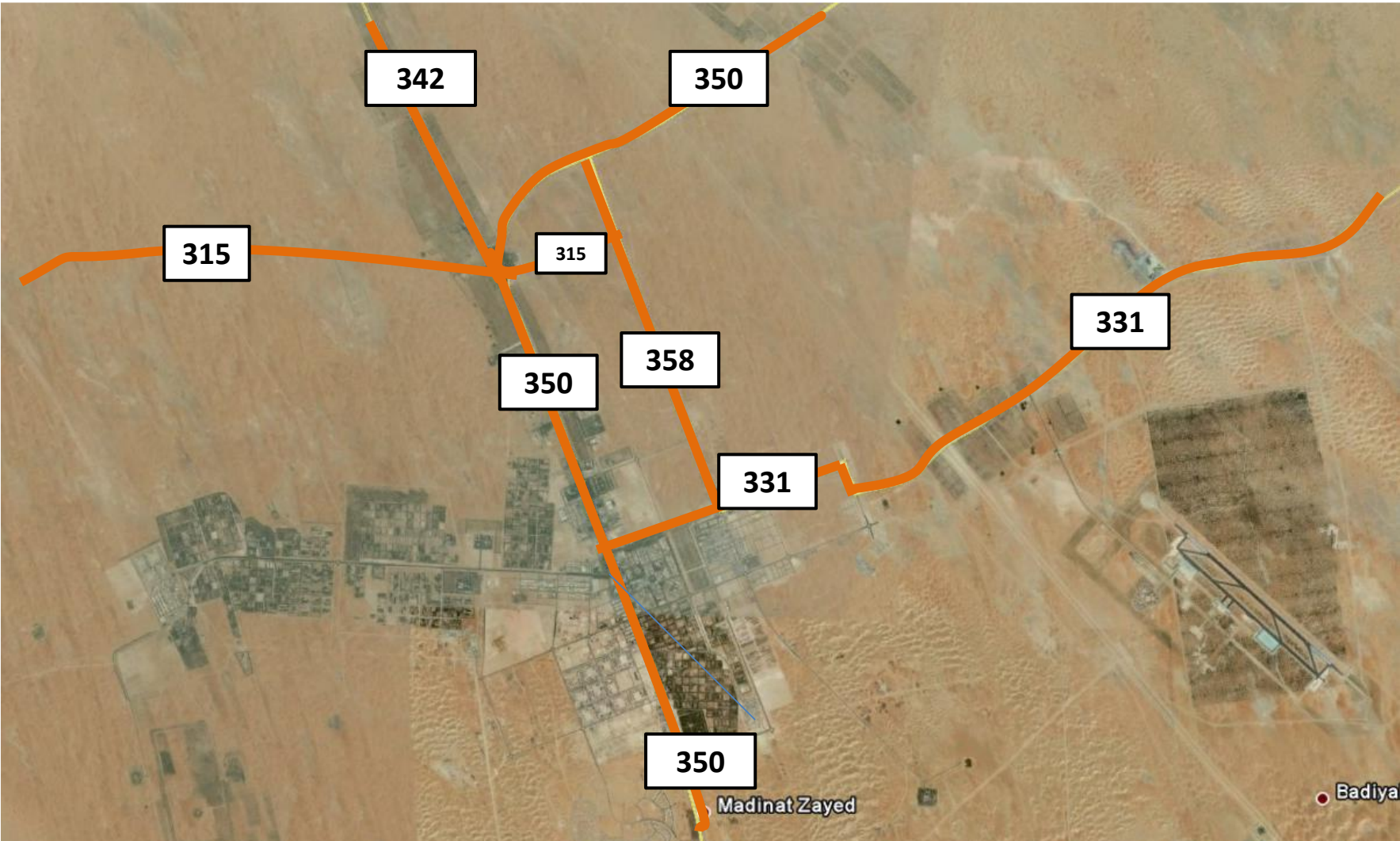


Figure 36: RNZ 3 (Western Region), North Central Section, Map 3-6 (Madinat Zayed)



Figure 37: RNZ 3 (Western Region), North Central Section, Map 3-7 (Tarif)



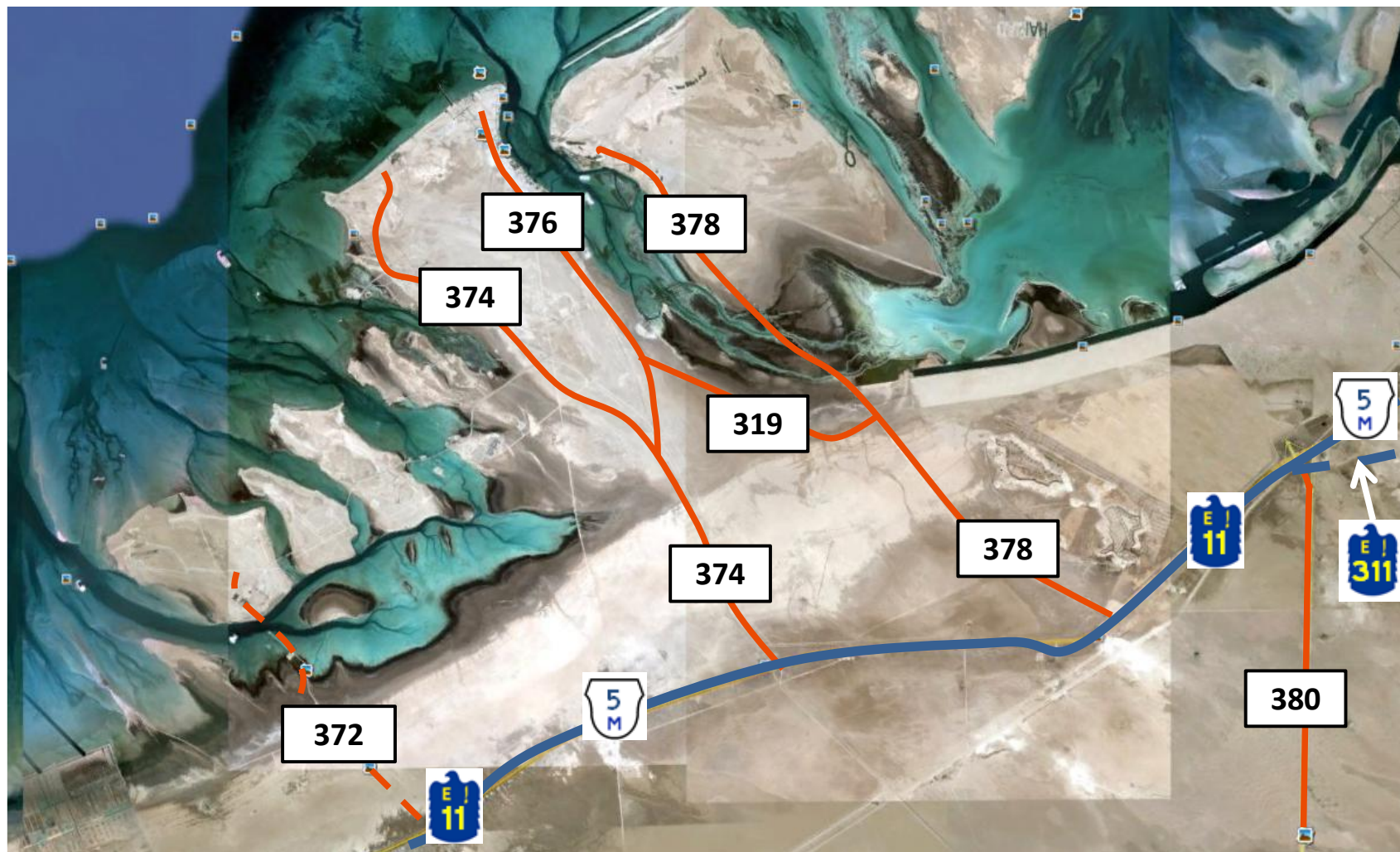


Figure 38: RNZ 3 (Western Region), North Central Section, Map 3-8 (Al Dabiya)

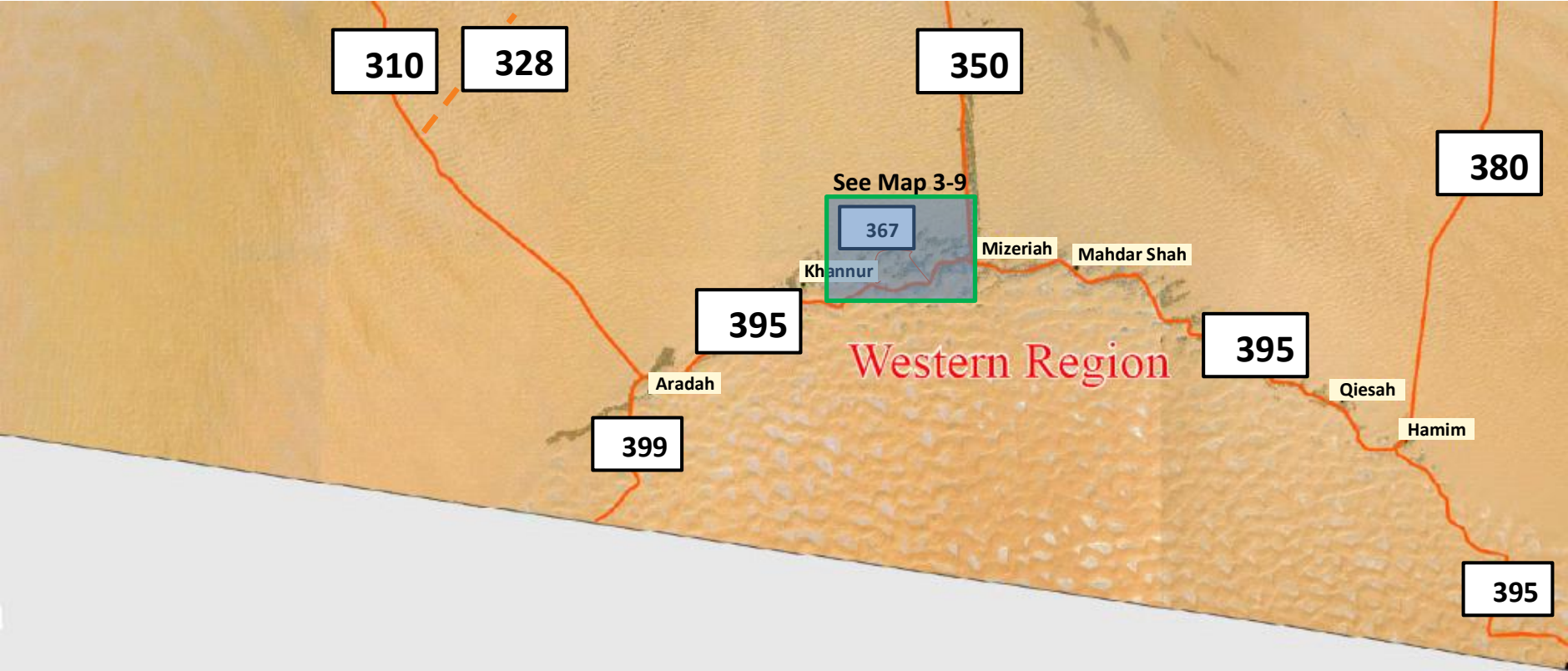


Figure 39: RNZ 3 (Western Region) Liwa Section



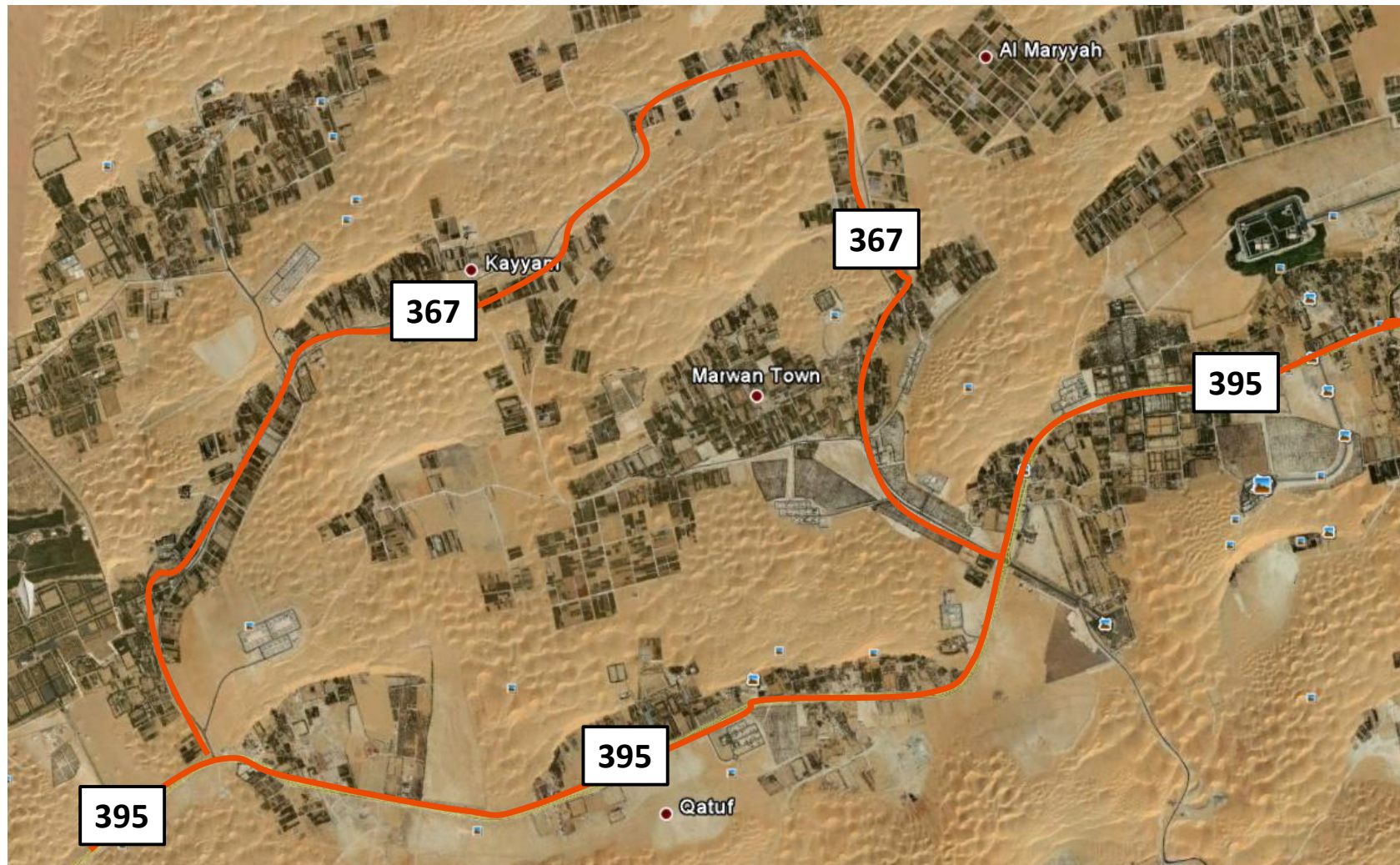


Figure 40: RNZ 3 (Western Region) Liwa Section, Map 3-9 (Marwan Town)

## **APPENDIX C: AGREEMENT ON INTERNATIONAL ROADS IN THE ARAB MASHREQ**



## **AGREEMENT ON INTERNATIONAL ROADS IN THE ARAB MASHREQ**

## **UNITED NATIONS**

**2001**

The Parties to the present Agreement, conscious of the importance of facilitating land transport on international roads in the Arab Mashreq and the need to increase cooperation and intraregional trade and tourism through the formulation of a well-studied plan for the construction and development of an international road network that satisfies both future traffic needs and environmental requirements, have agreed as follows:

### **Article 1**

#### **Adoption of the International Road Network**

The Parties hereto adopt the international road network described in Annex I to this Agreement (the “Arab Mashreq International Road Network”), which includes roads that are of international importance in the Arab Mashreq and should therefore be accorded priority in the establishment of national plans for the construction, maintenance and development of the national road networks of the Parties hereto.

### **Article 2**

#### **Orientation of the routes of the International Road Network**

The Arab Mashreq International Road Network consists of the main routes having a north/south and east/west orientation and may include other roads to be added in the future, in conformity with the provisions of this Agreement.

### **Article 3**

#### **Technical specifications**

Within a maximum period of fifteen (15) years, all roads described in Annex I shall be brought into conformity with the technical specifications described in Annex II to this Agreement. New roads built after the entry into force of this Agreement shall be designed in accordance the technical specifications defined in the said Annex II.

### **Article 4**

#### **Signs, signals and markings**

Within a maximum period of seven (7) years, the signs, signals and markings used on all roads described in Annex I shall be brought into conformity with the standards defined in Annex III hereto. New signs, signals and markings produced after the entry into force of this Agreement shall be designed in accordance with the technical standards defined in the said Annex III.

### **Article 5**

#### **Signature, ratification, acceptance, approval and accession**

1. This Agreement shall be open to members of the Economic and Social Commission for Western Asia (ESCWA) for signature at United Nations House in Beirut, from 10 May 2001 to 31 December 2002.
2. The members referred to in paragraph 1 in this article may become Parties to the present Agreement by:
  - (a) Signature not subject to ratification, acceptance or approval (i.e., definitive signature);
  - (b) Signature subject to ratification, acceptance or approval, followed by ratification, acceptance or approval; or
  - (c) Accession.
3. Ratification, acceptance, approval or accession shall be effected by the deposit of an instrument with the depositary.
4. States other than ESCWA members may become Parties to the Agreement, subject to the approval of all the ESCWA members parties thereto, by depositing an instrument of accession with the depositary.

## **Article 6**

### **Entry into force**

1. The Agreement shall enter into force ninety (90) days after the date on which five (5) members of ESCWA have either signed it definitively or deposited an instrument of ratification, acceptance, approval or accession.
2. For each member of ESCWA referred to in paragraph 1 of Article 5 signing the Agreement definitively or depositing an instrument of ratification, acceptance or approval thereof or accession thereto after the date on which five members of ESCWA have either signed it definitively or deposited such an instrument, the Agreement shall enter into force ninety (90) days after the date of that member's definitive signature or deposit of the instrument of ratification, approval, acceptance or accession. For each State other than a member of ESCWA depositing an instrument of accession the Agreement shall enter into force ninety (90) days after the date of that State's deposit of that instrument.

## **Article 7**

### **Amendments**

1. After the entry of the Agreement into force, any Party thereto may propose amendments to the Agreement, including its Annexes.
2. Proposed amendments to the Agreement shall be submitted to the Committee on Transport of the Economic and Social Commission for Western Asia (ESCWA).

3. Amendments to the Agreement shall be considered adopted if approved by a two-thirds majority of the Parties thereto, present at a meeting convened for that purpose. In the case of amendments to Annex I to the Agreement, such majority must include all Parties directly concerned by the proposed amendment.
4. The Committee on Transport of ESCWA shall inform the depositary, within a period of forty-five (45) days, of any amendment adopted pursuant to paragraph 3 of this article.
5. The depositary shall notify all Parties hereto of amendments thus adopted, which shall enter into force for all Parties three (3) months after the date of such notification unless objections from more than one-third of the Parties are received by the depositary within that period of three (3) months.
6. No amendments may be made to the Agreement during the period specified in Article 8 below if, upon the withdrawal of one party, the number of Parties to the Agreement becomes less than five (5).

#### **Article 8 Withdrawal**

Any Party may withdraw from this Agreement by written notification addressed to the depositary. Such withdrawal shall take effect twelve (12) months after the date of deposit of the notification unless revoked by the Party prior to the expiration of that period.

#### **Article 9 Termination**

This Agreement shall cease to be in force if the number of Parties thereto is less than five (5) during any period of twelve (12) consecutive months.

#### **Article 10 Dispute settlement**

1. Any dispute arising between two or more Parties to this Agreement which relates to its interpretation or application and which the Parties to the dispute have been unable to resolve by negotiation or other means of settlement shall be referred to arbitration if any Party so requests. In such a case the dispute shall be submitted to an arbitral tribunal to which each of the Parties shall appoint one member, and the members thus appointed shall agree on the appointment of a president of the arbitral tribunal from outside their number. If no agreement is reached concerning the appointment of the president of the arbitral tribunal within three (3) months from the request for arbitration, any Party may request the Secretary-General of the United Nations, or whomever he delegates, to appoint a president of the tribunal, to which the dispute shall be referred for decision.
2. The Parties to the dispute shall be bound by the decision to form the arbitral tribunal pursuant to paragraph 1 of this article and by any and all awards handed down by the tribunal. The Parties further undertake to defray the costs of arbitration.



**Article 11**  
**Limits of application of the Agreement**

Nothing in this Agreement shall be construed as preventing a Party hereto from taking any action that it considers necessary to its external or internal security or its interests, provided that such action is not contrary to the provisions of the Charter of the United Nations.

**Article 12**  
**Depositary**

The Secretary-General of the United Nations shall be the depositary of the Agreement.

**Article 13**  
**Annexes and list of technical terms**

The three Annexes to the Agreement and the list of technical terms used therein are integral parts of the Agreement.

IN WITNESS WHEREOF, the undersigned, being duly authorized thereto, have signed this Agreement.

DONE at Beirut, this 10 May 2001, in the Arabic, English and French languages, all of which are equally authentic.

## ARABIC, FRENCH, & ENGLISH TECHNICAL TERMS USED (Listed in the alphabetical order of the Arabic terms)

English Term	French Term	Arabic Term
Traffic Signal	Feux de signalisation	إشارة مرور ضوئية
Priority over oncoming traffic	Priorité à la circulation qui arrive	أولوية على المرور القادم
Superelevation	Superélévation	الرفع الجانبي
Convergence of traffic stream	Convergence du flux de la circulation	اندماج حركات المرور
Horizontal alignment	Alignement horizontal	تخطيط أفقي
Vertical alignment	Alignement vertical	تخطيط رأسي
Divergence of traffic stream	Divergence du flux de la circulation	تفرع حركات المرور
Intersection	Intersection	تقاطع
Roundabout	Rond-point	(دوار) تقاطع ذو جزيرة دائرية
At-grade Intersection	Croisement au niveau du sol	تقاطع على مستوى واحد
Interchange	Echangeur	تقاطع متعدد المستويات
Median	Médiane	جزيرة وسطية
Bridge	Pont	جسر
Truss	Poteau	جمالون
Guardrail	Barrière de protection	حاجز الحماية
Traffic volume	Densité de la circulation	حجم المرور
Design Hourly Volume (DHV)	Densité de la Circulation par Conception Horaire (DCCH)	حجم المرور للساعة التصميمية
Right of Way	Droit de Passage	حرم الطريق
Band	Bande	حزمة
Mountainous terrain	Terrain montagneux	طبيعة الأرض جبلية
Rolling terrain	Terrain onduleux	طبيعة الأرض متموجة
Level terrain	Terrain plat	طبيعة الأرض مستوية
Critical length	Longueur critique	حرج طول
Pavement Marking	Signalisation de la chaussée	الطريق سطح علامة
Vertical (overhead) Clearance	Déblaiement vertical	رأسية فسحة
Shoulder (s)	Epaule (s)	(أكتاف)كتف
Code (s)	Code (s)	(أكواد)كود
Sign	Panneau	لافتة
"GIVE WAY" Sign	Panneau "cédez la priorité"	(إفساح الطريق) "تمهل" لافتة
"End of Prohibition or Restriction" Sign	Panneau "Fin de l'interdiction ou la restriction"	"نهاية القيد والحظر" لافتة
Mandatory Sign	Panneau obligatoire	إجبارية لافتة
Informative Sign	Panneau instructif	إرشادية لافتة
Direction Sign	Panneau de direction	الاتجاه لافتة
Warning Sign	Panneau avertisseur	تحذيرية لافتة
Regulatory Sign	Panneau régulateur	تنظيمية لافتة
Road Number Sign	Panneau de numéro de la route	الطريق رقم لافتة
Advance Direction Sign	Panneau de direction avancé	لافتة متقدمة للاتجاه
Average Daily Traffic (ADT)	Moyenne de la Densité de la Circulation (MDC)	متوسط حجم المرور اليومي
Passing distance	Distance de dépassement	التخطي مسافة
Stopping distance	Distance d'arrêt	التوقف مسافة
Sight distance	Distance de vision	الرؤية مسافة

English Term	French Term	Arabic Term
Level of service	Niveau de service	مستوى الخدمة
Lane	Voie	(حارة) مسرب
Acceleration and deceleration lane	Voie d'accélération et de ralentissement	مسرب التسارع والتباطؤ
Slip road	Voie de déviation	التفرع مسرب
Left Turn Lane	Voie de deviation à gauche	لليسار الدوران مسرب
Speed Change Lane	Voie de changement de vitesse	مسرب تغيير السرعة
Climbing lane	Voie d'ascension	مسرب صعود
Rate of curvature	Courbe moyenne	معدل تغير الانحناء
Weaving Section	Section d'entrelacement	التناسج مقطع
Cross section	Section transversale	مقطع عرضي
Transition Curve	Virage de transition	منحنى انتقالي
Vertical grade	Pente verticale	(ميل طولي) رأسي
Cross slope	Pentes transversales	ميل عرضي
Traffic Control Device	Dispositifs de contrôle de la circulation	وسيلة التحكم المروري

For the definitions of these terms and those contained in the body of the agreement and its annexes one may refer to those annexes and the road specification codes and manuals of the countries of the region, such as the Egyptian, Jordanian and Saudi Arabian codes, and also the American code as described in the publication of the American Association of State Highway and Transportation Officials (AASHTO).

## ANNEXES TO THE AGREEMENT

### A. ANNEX I: ARAB MASHREQ INTERNATIONAL ROAD NETWORK

#### 1. North-south routes

##### (a) M5 Iraq, East Arabian Peninsula

Zakho (Iraq/Turkey) – Mosul – Baghdad – Al Samawah – Basrah – Safwan (Iraq/Kuwait) – Abdally (Kuwait/Iraq) – Kuwait – Nuwayseeb (Kuwait/Saudi Arabia) – Khafji (Saudi Arabia/Kuwait) – Abu Hadriyah (Dammam – Hufuf – Salwa)<sup>1F\*</sup> – Batha'a (Saudi Arabia/United Arab Emirates) – Al Ghweifat (United Arab Emirates/ Saudi Arabia) – Abu Dhabi – Dubai – Fujairah – Kalba (United Arab Emirates/Oman) – Khatmat Malahaw (Oman/ United Arab Emirates) – Sohar – Muscat – Nizwa – Thumrayt – Salalah.

##### (b) M7 Abu Dhabi-Sohar

Abu Dhabi – Al Ayn – Buraimi (United Arab Emirates/Oman) – Buraimi (Oman/ United Arab Emirates) – Sohar.

##### (c) M9 Al Ayn-Nizwa

Al Ayn – Mazyad (United Arab Emirates/Oman) – Hafit (Oman/ United Arab Emirates) – Nizwa.

##### (d) M15 Aleppo-Ramadi

Aleppo – Deir Ez Zor – Albu Kamal (Syria/Iraq) – Al kaem – (Iraq/Syria) – Ramadi.

##### (e) M25 Petroleum Pipeline

Hadithat – Ar'ar – Hafar El Batin – Abu Hadriyah.

##### (f) M35 Middle Arabian peninsula

Amman – Al Azraq – Omari (Jordan/Saudi Arabia) – Hadithat (Saudi Arabia/Jordan) – Sakakah – Ha'il – Buraydah – Riyadh – Al Kharj.

##### (g) M45 Syria-Jordan-Saudi Arabia-Yemen

Bab Al Hawa (Syria/Turkey) – Aleppo – Homs – Damascus – Nasib (Syria/Jordan) – Jaber (Jordan/Syria) – Amman – Ma'an – Al Mudawara (Jordan/Saudi Arabia) – Halat Ammar (Saudi Arabia/Jordan) – Tabuk – Qalibah – Medina – Mecca – Abha – Elb (Saudi Arabia/Yemen) – Baqim (Yemen/Saudi Arabia) – Sana'a – Ta'izz.

##### (h) M47 Ma'an-Aqaba

Ma'an – Aqaba.

##### (i) M51 Eastern Mediterranean Coast

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\* This section will eventually be replaced by the coastal road (Dammam – Salwa) upon its completion.

Kassab – Lattakia – Tartous – Dabboussieh (Syria/Lebanon) – Abboudieh (Lebanon/Syria) – Tripoli – Beirut – Naqoura.

(j) M55 Sinai – East Red Sea

Arish – Nakhel – Nuweiba – Aqaba – Ad Durra (Jordan/Saudi Arabia) – Ad Durra (Saudi Arabia/Jordan) – Dhuba – Yanbu – Rabigh – Jeddah – Darb – Al Tuwal (Saudi Arabia/Yemen) – Harad (Yemen/Saudi Arabia) – Hodeidah – Al Mukha.

(k) M65 Red Sea-West Coast

Ismailia – Suez – Safaga – Halayeb (Egypt/Sudan).

(l) M67 East Delta

Kantara Bridge – Ismailia – Cairo.

(m) M75 Nile Valley

Alexandria – Cairo – Qena – Arqine (Egypt/Sudan).

## 2. East-west routes

(a) M10 Northern Iraq-East Mediterranean

Hajj Omran (Iraq/Iran) – Irbil – Mosul – Rabieyyah (Iraq/Syria) – Yaaroubia (Syria/Iraq) – Kamishli – Aleppo – Lattakia.

(b) M20 Central Syria

Kamishli – Hasakah – Deir Ez Zor – Homs – Tartus.

(c) M30 Western Iraq-Eastern Mediterranean

Al Rutbah – Al Walid (Iraq/Syria) – Tanf (Syria/Iraq) – Damascus – Jedeidet Yabus (Syria/Lebanon) – Masna' (Lebanon/Syria) – Beirut.

(d) M40 Iraq, Jordan, Occupied Palestinian Territory and Mediterranean Southern Coast

Munthareya (Iraq/Iran) – Khanaqin – Baghdad – Ramadi – Al Rutbah – Tarabil (Iraq/Jordan) – Karamah (Jordan/Iraq) – Al Azraq – Amman – King Hussein Bridge (Jordan/Occupied Palestinian Territory) – Jerusalem – Gaza – Rafah (Egypt/Occupied Palestinian Territory) – Arish – Kantara Bridge – Port Said – Alexandria – Salum (Egypt/Libya).

(e) M50 Baghdad-Cairo

Baghdad – Karbala – Al Nukhaib – Jedeidat Ar'ar (Iraq/Saudi Arabia) – Jedeidat Ar'ar (Saudi Arabia/Iraq) – Ar'ar – Sakakah – Qalibah – Tabuk – Ad Durra (Saudi Arabia/Jordan) – Ad Durra (Jordan/Saudi Arabia) – Aqaba – Nuweiba – Nakhel – Shatt – Cairo.

(f) M60 Western Saudi Arabia-Upper Egypt

Dhuba – Safaga – Qena – Mutt.

(g) M70 Kuwait-Yanbu2F\*

Kuwait – As Salmy (Kuwait/Saudi Arabia) – Ar Ruqi (Saudi Arabia/Kuwait) – Hafar El Batin – Artawiyah – Buraydah – Medina – Yanbu.

(h) M80 Manama-Jeddah

Manama – King Fahd Bridge (Bahrain /Saudi Arabia) – Dammam – Riyadh – Mecca – Jeddah.

(i) M90 Doha-Ad Darb

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\* Eventually a section will be added upon being completed, branching off from this route at Artawiyah and heading east to Jubayl via A'bu Hadriyah.

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Doha – Abu Samra (Qatar/Saudi Arabia) – Salwah (Saudi Arabia/Qatar) – Batha'a (Saudi Arabia/United Arab Emirates) – Harad – Al Kharj – Sulayyil – Abha – Ad Darb.

(j) M100 Southern Arabian Peninsula

Thumrayt – Mazyounah (Oman/Yemen) – Shahan (Yemen/Oman) – Gheizah – Al Mukalla – Aden – Ta'izz – Al Mukha.



B. ANNEX II: TECHNICAL SPECIFICATIONS TO BE MET ON ROUTES IN THE  
ARAB MASHREQ INTERNATIONAL ROAD NETWORK

Table 1 gives the technical specifications to be met on routes in the Arab Mashreq road network.

The following is a detained description of those specifications.

1. *General remarks*

To ensure traffic safety, the protection of the environment, the smooth flow of traffic and user comfort, all parts of the routes mentioned in annex I and roads to be added to the international network must satisfy the conditions laid down hereinafter.

All members undertake to use their best efforts to comply with the provisions of this annex both in building new roads and in upgrading existing roads.

2. *Classification of international roads*

Roads in the Arab Mashreq International Road Network shall be classified as follows:

(a) First-class freeways: roads basically for use by motor vehicles of various types and on which use by bicycles and pedestrians is prohibited. These are dual-carriageway highways divided by a median, on which access is fully controlled by having all their intersections on different levels (interchanges) and having vehicles enter and exit via ramps at a limited number of points, in a manner that does not affect the flow of traffic.

(b) First-class expressways: dual-carriageway highways which are divided by a median and on which access is partially controlled by means of high-efficiency at-grade intersections, while interchanges may be used at certain points, taking into account considerations of safety and accident prevention. Access should be confined to a limited number of exit and entry points, and special lanes should be provided for changing speed and turning at intersections. On such roads, the direct entry and exit of vehicles to and from adjacent roads and establishments is prohibited.

(c) Second-class roads: roads designed to be medium-sized in keeping with the intended volume of traffic on them, affording an appropriate travelling speed. They consist of two lanes, one for each direction, not separated by a median strip. Intersections on such roads are at-grade. Interchanges, however, may be used when necessary. Roads of this type may be used only where there exist land availability constraints or financing is inadequate. Priority should be accorded to upgrading this type.

Table 1: Technical Specifications to be Met on the Routes of the Arab Mashreq International Road Network

No.	Specification		Draft agreement (December 2000)				Remarks	
1	Road classification		First-class freeways		First-class expressways	Second-class roads	<p>- These are the actual specifications of the American Association of State Highway and Transportation Officials (AASHTO). However, the names of the classes have been changed. In addition, no fourth class has been included as in the case of the Asian network, inasmuch as that class has modest characteristics that make it unsuitable for qualification as an international road.</p> <p>- The reason for adding the “freeway” class to those proposed in the study by the Council of Arab Ministers of Transport is to increase the efficiency of the international system, inasmuch as that class has excellent speed and safety characteristics and will help reduce traffic congestion and transport costs while improving highway safety.</p>	
2	Description		Dual-divided		Dual-divided	Single-carriageway		
3	Degree of access control		Total (grade-separated intersections)		Partial/total (at-grade/grade-separated intersections)	Partial (at-grade/garde-separated intersections)		
4	Design speed (km/hour)		L Level terrain	110-120	100-110		<p>Agrees with most studies and agreements and with AASHTO policy, subject to the following remark:</p> <p>- The adoption of a speed of 110-120 km/hour for first-class freeways offers flexibility and is at the same time more in keeping with the unified standards of the countries of the Gulf Cooperation Council (GCC).</p>	
			R Rolling terrain	100	80-100			
			M Mountainous terrain	80-100	60-100			
5	Design level of service		L R M	B B C			The standards established by AASHTO have been adopted owing to the importance of this factor, which must not be ignored in the determination of the number of lanes and the design of intersections.	
6	Cross sections between junctions	Right of way (metres)	50		40	25-40	<p>Agrees with existing specifications and agreements. Despite the fact that the appropriate right of way for a single road is 25 metres, a 40-metre right of way is preferred to permit widening to a dual-carriageway highway in the future, provided that the requisite area is available.</p>	
		Minimum number of lanes in both directions	4		4	2		
		Lane width (metres)	3.75(3.60)		3.75(3.30)		3.75(3.60)	<p>Agrees with AASHTO specifications.</p>
		Shoulder width (metres)	3.60(2.50) Median shoulder 1.20		2.40(1.20) Median shoulder 1.20 on divided roads		2.40(1.20)	
		Description of shoulders	Continuous paved shoulders, the paved portion of which should be no less than 1.20 metre or, in extreme cases, no less than 0.60 metre				AASHTO specifications	

## ROUTE NUMBERING SYSYTEM

No.	Specification	Draft agreement (December 2000)			Remarks
	Minimum median width (metres)	1.20-1.80	1.20-1.80 if there is no at-grade intersection and 3.60 if there is an at-grade intersection	None	AASHTO specifications
	Cross slopes on roadway (%)	1.50-2.00 (2.50 in areas exposed to heavy rains)			AASHTO specifications
	Cross slopes on shoulders (%)	2-6 (paved shoulders) 4-6 (stabilized crushed stone or gravel shoulders)			AASHTO specifications

TABLE 1 (*continued*)

No.	Specification			Draft agreement (December 2000)					Remarks	
7	Type of pavement			Not specified					AASHTO specifications	
8	Horizontal alignment	Maximum rate of superelevation (%)	12 8 (roads exposed to snowfalls) 6-8 (freeways built on bridges)					AASHTO specifications		
		Minimum radius on horizontal curves (metres)	Rate of superelevation/speed 6% 8%	60 135 125	80 250 350	100 435 395	120 755 665	AASHTO specifications		
		Minimum transition curve length (metres)	Rate of superelevation/speed 6% 8%	60 40 50	80 50 60	100 60 65	110 70 75	AASHTO specifications		
9	Vertical alignment	Maximum grade (%)	Speed (km/hour) Level terrain Rolling terrain Mountainous terrain	60 5 6 8	80 4 5 7	100 3 4 6	120 3 4 5	AASHTO specifications		
		Mean vertical curvature K (length (m) per % of grade difference)	Speed Crest Sag	60 14-18 15-18	80 32-49 25-32	100 62-105 37-51	120 102-202 50-73	AASHTO specifications		
		Critical length of grade (after which a climbing lane is added) (metres)	Vertical grade Length	3% 400	4% 280	5% 210	6% 170	7% 150	8% 135	AASHTO specifications
10	Minimum sight distance (metres)		Speed (km/hour) Stopping distance (metres)  Passing distance (metres)	60 74-85  407	80 113-139  541	100 157-205 670	120 203-286  792	AASHTO specifications		
11	Minimum vertical clearance (metres)		4.90 For pedestrian bridges and signboard trusses: 5.10 m					AASHTO specifications		
12	Tunnel and bridge cross sections		- On small structures the road and shoulders will continue to have the same width. - On long bridges (> 60 m) a distance of at least 1.20 m should be maintained between the guardrail and the curb. - On old existing structures, the safety distance may be reduced to 0.60 m, provided that priority is accorded to those structures for improvement or replacement and that the traffic signals and signs necessary for safety are provided.					AASHTO specifications		

TABLE 1 (*continued*)

No.	Specification	Draft agreement (December 2000)		Remarks
13	Intersections	<ul style="list-style-type: none"> <li>- Smallest possible number of points of intersection (minimum of 3 km between them).</li> <li>- It is preferable for roads crossing the international road to cross above it, leaving the international road at the ground level</li> <li>- Maintaining the basic number of lanes constant over suitably long distances.</li> <li>- Vertical grades should not exceed 8%.</li> <li>- The length of grades should not exceed the critical length for which the speed drops by 15 km/hour</li> </ul>		
14	Road facilities and installations	<ul style="list-style-type: none"> <li>- The distance from the edge of the roadway to safety barriers, fences and posts should be 3.00 m (1.20)</li> <li>- Fuel stations every 50 km</li> <li>- Service station with vehicle repair workshop and rest area at least every 200 km</li> </ul>		
15	Axle load as a basis for the structural design of the road (Tons)	Not specified		AASHTO specifications
16	Axle load as a basis for defining maximum vehicle load (Tons)	Single front (steering axle): 6.5 Tons Single rear: 13 Tons Dual rear:		<ul style="list-style-type: none"> <li>- The vast majority of the ESCWA members have adopted a single rear axle load of 13 Tons which represents, about 82% of the members within ITSAM. It is recommended to use a single axle load of 13 tons in order to reduce transport costs in the region.</li> <li>- The dual axle load, as referred to in the unified standards of the countries of the Gulf Cooperation Council, has been chosen as the standard.</li> </ul>
		Distance between axles 0.90 1.00 1.10 1.20 1.30 1.35-2.50 Greater than 2.50	Load (Tons) 14.7 16.1 17.5 18.9 20.3 21.0 Considered as two singles	
17	Maximum vehicle dimensions (metres)	Width Length Height	Not specified Not specified Not specified	In accordance with the European Agreement on Main International Traffic Arteries and the Asian Highway uniform specifications.

### 3. *Engineering design considerations*

#### (a) *Introduction*

Engineering characteristics are chosen in such a way as to guarantee users traffic safety and the least possible congestion, taking into consideration the functional classification of the road and the general behaviour of drivers and users of the road.

It is essential, on international roads, to adopt uniform characteristics over long stretches and not to change from one road classification to another except at points identifiable by drivers (such as approaches to heavily populated areas, places where there is a major change in the topography of the region and interchanges), due attention being paid to transition zones. When road improvement work is done, moreover, it is important to ensure that at each stage of the work the harmony of the road is maintained.

It is essential to make sure that the minimum safety requirements are met in every part of the network and to take into account the actual speeds of drivers, bearing in mind the type of planning adopted for the road and the applicable laws and regulations.

#### (b) *Design speed*

An appropriate design speed should be established according to the road classification. The design speed is the speed which is chosen at the time of construction or improvement of the road to establish the engineering characteristics and at which drivers may safely travel.

#### (c) *Traffic volume and design level of service*

The design traffic volume depends on predictions of average daily traffic (ADT) for the target year (20th year), which is converted to the design hourly volume (DHV), i.e., approximately 15% of ADT.

The number of lanes is determined on the assumption that an appropriate level of service is as follows:

Level and rolling terrain: B  
Mountainous terrain: C

#### (d) *Cross sections*

The numbers in parentheses ( ) represent the absolute minimum values.

The shoulders should consist of continuous paved strips that are stabilized so as to permit stopping if need be; if there is not sufficient available space for the shoulder, the road should be provided with long stopping strips.



Care must be taken to execute the shoulders in the widths indicated above to ensure that they are not less than the minimum. On second-class roads, if there does not exist sufficient space, the shoulder width should not under any circumstances be less than 1.20 m, it being understood that priority will be granted to the improvement of such roads.

The main purpose of the median is to separate the two traffic directions. It also provides a space in which a driver who has lost control of a vehicle may regain that control in an emergency and also a width in which a speed-change lane or a left-turn lane may be provided or future widening of the road may be effected. For these reasons the preferred median width is 20 m, and in any case it should not be less than the dimensions indicated in the above table.

(e) *Horizontal alignment*

In so far as possible, the use of the minimum radius values should be avoided; under normal circumstances it is preferable for the minimum values to be approximately 50 to 100% greater than those indicated. Moreover, transition curves to connect the different radii should be used.

(f) *Vertical alignment*

The length of a grade should not exceed the critical length, so as to avoid vehicle speed drops of more than 15 km/hour. When the length of such a grade exceeds the critical length, additional climbing lanes are required to enable slow vehicles to travel on them without their speed decrease affecting the capacity of the road.

(g) *Sight distance conditions*

It is important to provide for adequate sight distance equal at least to the stopping sight distance upon noticing an obstacle. On two-lane roads, the sight distance should be at least equal to the passing distance. Where this is not the case, the road should be provided with appropriate signs and pavement markings to prevent overtaking and passing zones should be provided at various appropriate distances.

(h) *Vertical clearance*

The minimum vertical clearance value is 4.90 m. This will permit trucks to pass safely through tunnels and under bridges.

In the case of pedestrian bridges and signboard trusses, the vertical clearance should be no less than 5.10 m. It is preferable to allow an additional tolerance to permit future paving on the order of 0.15 m.

(i) *Tunnel and bridge areas*

The road should continue with the same width, including shoulders, in all tunnels and bridges. On bridges whose length is greater than 60 m, which are considered long, the width

may be reduced on condition that a safety width of at least 1.20 m is maintained between the bridge railing and the edge of the pavement closer to it.

Existing bridges may be kept, provided that they are capable of carrying the weights and loads of the vehicles mentioned in table 1 and their width equals the width used for traffic plus a safety margin of 0.60 m and on condition that they are accorded priority for widening or replacement in the future. In such a case, signs and markings should be provided to warn drivers that they are approaching a narrow structure.

(j) *Intersections and Interchanges*

(1) *General considerations*

- a. Planning fundamentals and principles should be consistent for all the intersections on a given road;
- b. The number of intersecting roads should be kept to a minimum by changing the patterns of some of the traffic streams crossing the international road. The distance between interchanges should be no less than 3 km;
- c. The basic number of lanes should be maintained constant over appropriate distances. The number of lanes may be greater than that required to accommodate a particular volume of traffic with a view to avoiding repeated changes in the number of lanes over short stretches;
- d. At junctions, entrances to and exits from the international road should be on the right of the through traffic;
- e. Traffic on the international road shall have priority except in special cases (e.g., an intersection with another international road or other road having a heavy volume of traffic);
- f. All intersections with first-class freeways shall be grade-separated;
- g. Intersections with dual- and single-carriageway highways should preferably be grade-separated. If there are obstacles to this, they may be of the at-grade type;
- h. The use of roundabouts is not recommended except in special cases (such as transition zones, suburbs, etc.);
- i. Signalized intersections should be used minimally and only on condition that they are characterized by high operating efficiency, visibility and safety for all users;

- j. All intersections with railway tracks should be grade-separated; if, however, this is not possible and at-grade crossings are used, it is essential to observe the following:
  - i. The angle of intersection should be a right angle in so far as possible;
  - ii. The crossing should not be on a horizontal curve on either the road or the railway line;
  - iii. The crossing should be on a horizontal level in so far as possible. Under difficult topographic conditions there should be an intersection width whose level is horizontal and which measures no less than 1.00 on the side of each rail;
  - iv. The highway should be provided with markings, warning signs, warning devices and mechanical gates;
  - v. In the event that illuminated warning devices and gates are not provided, care should be taken to ensure for the vehicle driver a sight distance of no less than 400 m on the highway and 1000 m on the railway.

(2) *At-grade intersections*

- a. At-grade intersections should be built in such a way as to provide maximum visibility and understanding of traffic in all directions on the part of users;
- b. Complex layouts that are difficult for drivers to comprehend are to be avoided. In the event that there exist more than four legs at an intersection, some of the legs should be combined so that there are no more than four, or roundabouts should be used if need be;
- c. The angle of intersection should be a right angle in so far as possible;
- d. Special lanes should be used for speed changes; their boundaries should be defined with markings, traffic islands and traffic lights that are clear to users;
- e. Users should be advised regarding roads having priority for crossing an intersection so that they do not accelerate at the intersection; therefore there should be no increase in lane width or in the number of lanes.

(3) *Interchanges*

The choice of type of interchange rests on a number of factors related to the use of simple layouts that ensure that traffic demands are met and that order and harmony are

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maintained. “Harmony” here relates to those aspects that help road users anticipate the way in which similar movements will take place in traffic, even if the type of interchange differs.

Indicated below are some of the important engineering characteristics of interchanges. Other characteristics are defined in accordance with known engineering practices. These characteristics can be summed up as follows:

a. *Slip roads*

Vertical grades on slopes and loops should not exceed 8%.

The length of upgrades should not exceed the critical length, so as to avoid vehicle speed reduction by more than 15 km/hour.

b. *Weaving sections*

Weaving sections should be of sufficient length to ensure traffic safety and achieve the desired level of service.

c. *Divergence of traffic streams*

Lanes should be separated in such a way as to enable the driver to choose the appropriate lane for the direction he wishes to take and to see the point of divergence from a sufficient distance that should be longer than the distance required for passing. For this purpose, road signs and pavement markings should be provided at suitable distances. Lighter traffic streams should be directed to the lane headed towards the right.

d. *Convergence of traffic streams*

The convergence distance should be designed in such a way as not to give rise to any reduction of vehicle speed. Convergence should preferably take place by means of acceleration lanes so as to permit maintenance of constant speeds. It is also preferable for lighter traffic to merge from the right side into the heavier traffic.

e. *Acceleration and deceleration lanes*

Entry and exit at interchanges should take place by means of acceleration and deceleration lanes of constant width preceded or followed by gradual narrowing.

#### 4. *Road installations and facilities*

Providing the road with the appropriate installations and facilities constitutes an essential factor for enabling the road network to play its desired role in a way that ensures the flow and safety of traffic and the comfort of users. One of the most fundamental

requirements of such installations and facilities is that they should be uniform, inasmuch as they are installed for fast-moving road users coming from different members. The following is a description of such installations and facilities:

(a) *Guardrails*

These are longitudinal barriers to protect road users against all possible accidents or to minimize the effects of such accidents, and also to prevent vehicles from leaving the road surface.

Guardrails are used on medians, beyond the shoulder in places where solid obstacles might protrude near the traffic lanes, in places where the elevation or slope of the surface might present a danger for vehicles or the adjacent land or in places in which the road crosses a watercourse or railway.

The use of such barriers is recommended only in dangerous places, inasmuch as they themselves constitute a solid obstacle along the road.

The distance from the outer edge of the shoulder to guardrails is 3.00 m, the minimum value suitable for this distance being 1.20 m.

Height of guardrails above shoulder surface: 0.70 - 1.00 m.

Types: metal girders, metal cables, concrete barriers, anti-twist posts.

The choice of barrier type depends on the cross section of the road, maintenance possibilities and problems relating to visibility.

(b) *Delineators*

To delineate the roadway, use should be made of devices such as highway stakes and short posts provided with reflectors to improve roadway visibility, especially at night and when there is fog. They should be placed in danger zones on the road, especially on horizontal curves.

(c) *Anti-glare devices*

Fences or hedges of trees should be put in place to prevent glaring light from blinding drivers. Such barriers should be placed on the median as well as along the shoulder if there is a parallel road adjacent to the international road.

(d) *Highway lighting*

The highway should be provided with adequate lighting at both interchanges and at-grade intersections, tunnels, bridges, border-crossing points and rest areas. Adequate, uniform lighting should also be provided where the highway passes through an area with special lighting that is disturbing to drivers (such as airports, industrial zones and heavily populated residential areas), provided that this is warranted by a heavy volume of traffic.

(e) *Highway user information*

Highway users should be provided, as and when appropriate, with information on road and traffic conditions by any suitable means, and it is essential to make sure that such information has been received, especially in tunnels.

(f) *Emergency communication systems*

Highways should be equipped with emergency telephone systems and distinctively marked communication towers which are in contact with a communication centre 24 hours a day. Such communication points, which should be erected off the road and away from any fixed installations, should be set up in adequate numbers at uniform intervals, the maximum distance between them being five kilometres. Signs should be erected indicating the direction of and distance to the nearest communication point. Where the erection of communication points is not feasible, recourse may be had to public telephones, in which case signs should be placed along the road indicating the location of the nearest public telephone. Clear instructions for using the telephone should be present in both Arabic and English.

(g) *Service facilities*

Service stations, vehicle repair shops and rest areas: at intervals no greater than 200 km.

(h) *Toll-booth areas*

It is essential to locate toll-booth areas in clear, open places and to avoid hazardous areas such as the lower part of vertical curves. Ample space must be set aside for toll-booth area facilities, such as control areas and residential areas for toll-station employees.

(i) *Border-crossing centres*

The design of border-crossing centres must take into account aspects relating to the types, number and distribution of vehicles passing through them as well as the transit traffic volume. Buildings must be erected for border-crossing operations, such as security procedures, customs, sanitary inspection and others. It is advantageous to establish, by agreement between the parties concerned, common border-crossing centres between two neighbouring members with a view to facilitating traffic flows and consequently increasing trade and tourism.

It is important to equip border-crossing centres with adequate traffic signals to determine the movement of trucks and private cars, which should follow separate lanes. At border-crossing centres having a heavy volume of truck traffic, adequate facilities should be built to ensure the rapid completion of operations; moreover, if there are truck weighing stations, a place should be set aside for them that does not impede the flow of traffic at the border-crossing centre.



(j) *Auxiliary facilities*

(1) *Pedestrian safety*

In the extremely limited number of places where the crossing of pedestrians is permitted, special bridges or tunnels must be built for such crossing.

(2) *Protection of the disabled*

It is essential to provide facilities for the travel of disabled persons, and it is therefore essential to provide special means to facilitate their movements, especially at rest areas, as well as other services in keeping with their special needs.

(3) *Protection of animals*

Protective fences must be provided along both sides of the highway in places where animals are likely to cross. Inasmuch as such animals must be kept away from the roadway, special places must be provided for them to cross.

## 5. *Vehicle characteristics*

(a) *Axle loads*

(1) *Standard axle load as a basis of structural design for pavements, bridges and footbridges*

Depends on the design method followed in each member.

(2) *Axle loads*

As indicated in table 1.

## 6. *Environmental considerations*

The region's international road network is not for regional use alone: to a large extent it will serve international traffic and transit to the region. For this reason it must provide means of environmental protection and the greatest possible preservation of adjacent natural areas (rivers, trees, etc.). Furthermore, increased traffic on portions of the network passing in the vicinity of residential areas may require the construction of noise barriers.

## 7. *Maintenance*

(a) *General considerations*

The Arab Mashreq road network and all related facilities must be maintained in like-new condition to ensure the safety and comfort of highway users. Clearly defined programmes must be set up for the maintenance of any road in the network so as to avoid

traffic delays due to failures occurring in it. It is important for the maintenance programmes set up to cover all aspects of the road, including asphalt surfaces, concrete and steel structures, cut and fill areas, water drainage areas, traffic signals and signs of all types, as well as tree growth, etc., so as to prevent plant growth from reducing sight distance. In addition, special maintenance equipment must be made available, such as equipment for snow removal and for clearing stream beds, so that the absence of such equipment will not constitute a hindrance to the flow of traffic.

On all parts of the network it is essential to distinguish between preventive maintenance and routine maintenance, so as to be able to institute the most efficient maintenance programme possible.

(b) *Maintenance management systems*

The maintenance management system on all parts of the Arab Mashreq road network requires specialized programmes. Such maintenance programmes should be entrusted to competent highway authorities, who will play the primary role in collecting and analysing data and taking decisions relating to maintenance.

The authorities concerned in each member should be in possession of detailed information relating to roads in order to be able to help expedite the performance of maintenance operations in the event of accidents so that they do not result in any hindrance to the flow of traffic.

Budget allocations should be made for maintenance operations and their priorities should be defined on the basis of the results of field measurements and observations to facilitate visibility both night and day and also in the light of recognized international requirements.

It is imperative that the authorities concerned with the implementation of planning policies and maintenance should take into account all the related aspects, such as installing traffic signals, defining vehicle speeds and ensuring the proper performance of maintenance work in accordance with the programmes established for that purpose.

(c) *Special maintenance issues*

Special care should be given to maintenance work having a bearing on traffic safety. Such work includes the following:

- (1) Pavement work for providing an anti-skid surface and also water-drainage works;
- (2) Concrete structures, and in particular expansion joints, supports and railings, whether on bridges or tunnel structures;
- (3) Lighting and traffic safety means;
- (4) Road signs and pavement markings;

- (5) Works connected with the removal of all materials that might cause traffic accidents, such as snow, sand, etc.

It is imperative to make sure of the quality of the international road network by implementing a maintenance policy that guarantees continuity of service during maintenance work; moreover, such work should be performed at suitable times, so as to avoid excessive deterioration of the pavement.

The safety of road maintenance crews must be ensured. This means taking adequate measures, to be adopted during the planning of the maintenance work and continuously adhered to throughout its actual performance.

Highway safety devices, such as traffic signs and signals, must be fully available so as to prevent traffic accidents and the hampering of the flow of vehicle traffic. Such devices must be clearly visible both day and night. Periodic inspections should be conducted to make sure that they are clear and are providing their intended messages and that they are in accord with the international practices that govern such matters.

The continuity of the flow of traffic under adverse weather conditions over the entire international road network must be ensured to the utmost degree. Care must be taken to remove snow and ice, earth or sand from the roadway and all traffic signs and signals, which constitutes additional maintenance work to be performed during certain seasons.

C. ANNEX III: STANDARD ROAD SIGNS,  
TRAFFIC SIGNALS AND PAVEMENT MARKINGS  
ON THE ROUTES OF THE ARAB MASHREQ  
INTERNATIONAL ROAD NETWORK

1. *General remarks*

(a) The signatories to the Agreement undertake to design and produce traffic signs and signals and pavement markings in accordance with the Convention on Road Signs and Signals of 8 November 1968 (the Vienna Convention), prepared by the United Nations, as amended;

(b) The specifications contained in the Vienna Convention concerning the shape of signs for which more than one option is proposed with regard to geometric shape and color are defined in section 2 of this annex, entitled "Sign shapes";

(c) The dimensions of signs are defined in section 3 of this annex, entitled "Sign dimensions";

(d) The specifications regarding the writing on signs are defined in section 4 of this annex, entitled "The writing on road signs";

(e) The road number signs characteristic of the roads of the Arab Mashreq should be as described in section 5 of this annex, entitled "Road number sign".

2. *Sign shapes*

(a) *Warning signs*

(Vienna Convention, annex 1, section A, Danger warning signs, paragraph 1):

Definition: The sign shape is in accordance with model (Aa), which is an equilateral triangle having its base horizontal and the opposite vertex above it; the ground is reflective white and the border reflective red, while the figures, forms and symbols are dark black.

(b) *Informative signs*

(Vienna Convention, annex 1, section F, Information, facilities or service signs, paragraph 1):

Definition: Signs indicating services and useful information shall be in the shape of a rectangle having a blue ground, with writing in white, or in accordance with the Vienna Convention.

(Vienna Convention, annex 1, section G, Direction, position or indication signs, paragraph 3):

Definition: Advance direction signs and direction signs shall be rectangular, having writing and symbols displayed in white on a blue ground with a white border, or in accordance with the Vienna Convention.

(c) *Regulatory signs*

(1) “STOP” sign

(Vienna Convention, annex 1, section B, Priority signs):

Definition: The model used is B, 2a; the “STOP” sign shall have a red ground with a white border, the word “STOP” being written in white in both Arabic and English.

(2) “GIVE WAY” sign

(Vienna Convention, annex 1, section B, Priority signs):

Definition: The “GIVE WAY” sign shall consist of an equilateral triangle having one side horizontal and the opposite vertex below it. The ground shall be white and the border red.

(3) “END OF PROHIBITION OR RESTRICTION” sign

(Vienna Convention, annex 1, section C, Prohibitory or restrictive signs, subsection II. 8):

Definition: Circular with a white ground, without a border, bearing a group of black or dark grey parallel lines sloping downward from right to left.

(4) “PRIORITY FOR ONCOMING TRAFFIC” sign

(Vienna Convention, annex 1, section B, Priority signs):

Definition: Circular, with a white ground and a red border. The arrow pointing upward shall be red and the other arrow white.

(5) Mandatory signs

(Vienna Convention, annex 1, section D, Mandatory signs, paragraph 2):

Definition: Mandatory signs shall be circular, without a border, with a blue ground and white symbols, or in accordance with the Vienna Convention.

### 3. *Sign dimensions*

Signs shall be in three sizes: small (600-750 mm), regular (900 mm) and large (1200-1500 mm), the size being determined by the maximum speed on the highway, as can be seen from table 2.

TABLE 2. TRAFFIC SIGN DIMENSIONS

Nature of sign	Shape	Maximum speed (km/hour)		
		60-75	> 75-90	> 90
Warning	Equilateral triangle Side length (mm)	600-750	900	1200-1500
STOP	Equilateral octagon Diameter (mm)	600-750	900	1200-1500
GIVE WAY	Equilateral triangle Side length (mm)	600-750	900	1200-1500
Priority Road	Square Length of side (mm)	600-750	600-750	600-750
Priority over oncoming traffic	Square Length of side (mm)	600-750	600-750	600-750
Other regulatory	Circle Diameter (mm)	600-750	900	1200-1500

#### 4. *The writing on road signs*

Writing on signs shall be in both Arabic and English, the height of the Arabic letter “alif” being at least 1.5 times the height of the lower-case English letter.

Writing in Arabic shall be in the naskhi script; writing in English shall be in Roman type.

The space between lines should be equal to the letter height.

As for letter size, signs should be designed to be easy to read and to enable the driver to respond quickly at the appropriate time, which means that the characters should be adequately large for the speed of traffic on the road.

Character height on informative signs depends on the maximum permissible speed on the highway, as shown in table 3.



TABLE 3. MINIMUM CHARACTER HEIGHT IN WRITING ON INFORMATIVE SIGNS  
(ENGLISH LOWER CASE)

Maximum speed	Pre-advance informative signs	Advance informative signs	Informative signs
(km/hour)	Character height (mm)	Character height (mm)	Character height (mm)
60-75	150	100	100
> 75-90	200	150	100
> 90	300	300	300

It should be noted that the principal difference between the pre-advance informative signs and advance informative signs referred to in table 3 above lies in the distance from the signs to the intersection before which they are placed.

#### 5. *Road number signs*

The routes of the Arab Mashreq international road network are designated by the letter M followed by the road number. For this reason, one must make certain that this symbol is not used to identify roads in accordance with the national numbering system.

Road number signs must be repeated at intervals of approximately 10 km on first-class freeways and expressways and every 20 km on second-class roads. The road number should be indicated before and after every point of entry or exit to or from the international road, whether at interchanges or at-level intersections.

The shape, design and colours of the sign shall be determined subsequently, prior to the entry into force of the Agreement.

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