Annex F

Traffic Assessment

F1 INTRODUCTION

This Annex presents the methodology, findings and recommendations of the traffic impact assessment of the Gaziantep Integrated Healthcare Campus (the Project), located in Şahinbey District of Gaziantep, southeast Turkey.

The assessment considers Project activities during construction and operation with the potential to cause traffic impacts.

F1.1 ASSESSMENT OBJECTIVES

The objective of the assessment is to identify the existing traffic conditions around the Project Site and Gaziantep City, describe the traffic conditions that will likely exist over the Project's life (particularly during operation) and propose recommendations to address the significant traffic related impacts.

F1.1.1 Scope of the Assessment

This assessment has been based on the review of publicly available information, information obtained from relevant governmental authorities (i.e. Gaziantep Metropolitan Municipality, Department of Transportation Planning and Rail Systems) and an interim traffic impact study conducted by the SPV.

The scope of the assessment includes:

(i) identification of existing traffic conditions and transportation infrastructure around the Project site and Gaziantep City;

(ii) identification of future road network planning for the region and in the vicinity of the Project Site;

(iii) a traffic demand assessment; and

(iv) a proposed traffic site plan for the Project (staff parking, visitors' parking, servicing facilities, parking for service vehicles and provisions for emergency vehicles).

F1.1.2 Study Area

The study area for the traffic assessment covered the Project Site as well as Gaziantep Province as a whole.

F2 METHODOLOGY

F2.1 RELEVANT DOCUMENTS, STANDARDS AND GUIDELINES

IFC EHS Guidelines on Community Health and Safety covers traffic safety and identifies road safety initiatives. The document also suggests mitigation measures for projects that potentially contribute to significant increase in traffic along existing roads.

An Interim Traffic Impact Study (dated April 2016) has been undertaken by technical consultants of the SPV. This provides data on the expected traffic loads on the existing roads during Project operation, highlights critical traffic issues and details traffic calming arrangements on the Project Site.

Gaziantep Metropolitan Municipality, Department of Transportation Planning and Rail Systems has prepared a Draft Transport Master Plan for Gaziantep Province, which has been used to describe the baseline traffic conditions of the province.

F2.2 DESKTOP ANALYSIS

Baseline data was gathered from the websites of the General Directorate of Highways and through face to face meetings with Gaziantep Metropolitan Municipality, the Department of Transportation Planning and Rail Systems and the Department of Housing and Urban Planning. The key sources of information used to establish the baseline conditions are presented below.

- General Directorate of Highways, 2014 Motorways and State Roads Traffic Flow Map, General Directorate of Highways, Department of Traffic Safety, Division of Transport Surveys, June 2015.
- 1/1,000 scaled Local Zoning Plan, (Şahinbey Municipality; Received during face to face meeting with the Mayor).
- 1/5,000 scaled Master Plan for Gaziantep (Received on July 2015 during a meeting with the Housing and Urban Planning Department, Directorate of City Planning).
- 1/100,000 scaled Environmental Plan for Gaziantep, Spatial Planning Directorate of the MEUP (Received in March 2015).
- Official opinion letter of Gaziantep Metropolitan Municipality, Department of Transportation Planning and Rail Systems including the Draft Gaziantep Transport Master Plan.
- Gaziantep IHC Traffic Impact Study (TIS) Interim Report (dated April 2016).

- Gaziantep IHC Construction Traffic Management Plan that has been prepared to outline specific measures that will be undertaken to manage the traffic conditions in the Project Site during the construction phase.

F2.3 ENGAGEMENT WITH REGULATORY AUTHORITIES

The Project team held face to face meetings with the Gaziantep Metropolitan Municipality, the Department of Transportation Planning and Rail Systems and the Department of Housing and Urban Planning to gather data and discuss and understand existing traffic conditions and future planning. An official opinion letter from the Department of Transportation Planning and Rail Systems was received on 13th of July 2015, which includes relevant baseline information extracted from the Draft Gaziantep Transport Master Plan. As reported, the preparations of the final plan are still ongoing and it is expected to be concluded in mid-2016.

F2.4 FIELD SURVEY

Within the scope of the Interim TIS, a field survey was conducted on 17th of February 2016 in order to undertake traffic counts and observe the traffic conditions around the Project Site. In addition, the current transportation network around the Project Site was evaluated and traffic count was conducted at the junction between 400th Street and Özdemir Street.

F2.5 IMPACT ASSESSMENT METHODOLOGY

The assessment of likely impacts is determined by assigning ratings for impact magnitude and the sensitivity/vulnerability/importance of receptors/ resources as described in *Volume I, Chapter 5*. Once the magnitude of the impact and sensitivity of the resource/receptor is characterised, impact significance is assigned using the significance matrix presented in *Volume I, Chapter 5.*

Table F2.1 and *Table F2.2* describe the designations used for impact magnitude and resource sensitivity/vulnerability/importance when assessing impacts related to traffic.

Table F2.1 Magnitude of Impact

Magnitude	Definition
Large	• Major increase (>50%) in road traffic for public and private cars in the region but still within the design carrying capacity of the transport system. • Existing transport system is close to or above the design carrying capacity and the increase in traffic due to operation of the Project no matter how small results in exceeding the design carrying capacity of the transport system in the region.
Medium	• Moderate increase (between 10%-50%) in traffic for public and private transport systems in the region but still within the design carrying capacity of the transport system.

Magnitude	Definition
Small	• Small increase (<10%) in local traffic in the immediate surroundings of the Project which have sensitive receptors (schools, dormitory, residential areas) but still within the design carrying capacity of the transport system.
Negligible	• Temporary and small increase (<10%) in local traffic in the immediate surroundings of the Project (during construction and operation) which have sensitive receptors (schools, dormitory, residential areas).

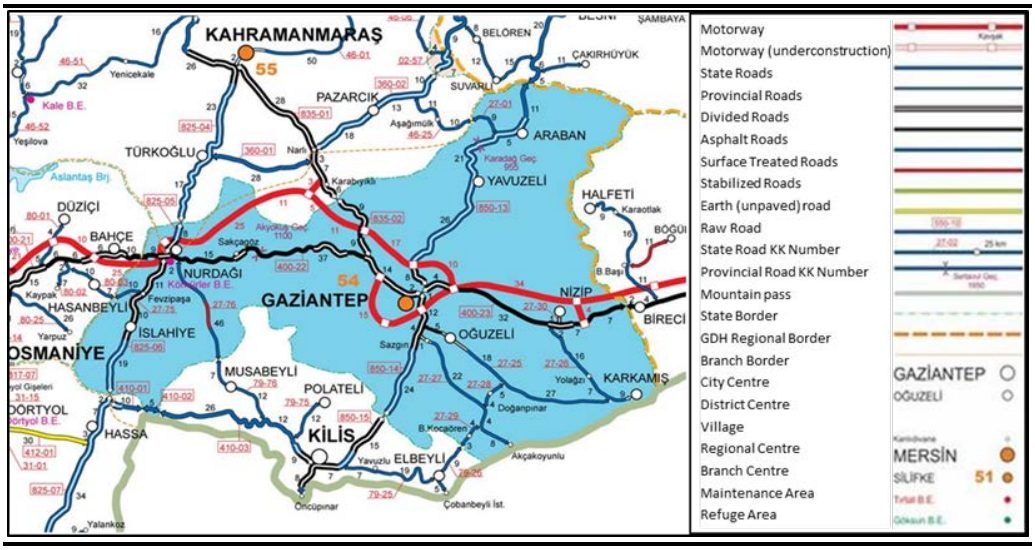
Table F2.2 Receptor Sensitivity/Vulnerability/Importance

Value	Definition
Low	• Vulnerable receptor (i.e. user of road network) with good capacity to absorb change.
Medium	• Vulnerable receptor with limited capacity to absorb change.
High	• Vulnerable receptor with little or no capacity to absorb change.

F3.1 OVERVIEW OF THE GAZIANTEP ROAD TRANSPORT NETWORK

The General Directorate of Highways has categorised the country into regions and Gaziantep lies within the 5th Regional Directorate of Highways. The region covers an area of 61,683 km² including Adana, Gaziantep, Hatay, Mersin, Kahramanmaraş, Kilis and Osmaniye. Malatya, Kayseri, and Adıyaman Provinces are also partially included. The transportation network map for the 5th Regional Directorate of Highways, focusing on Gaziantep and its vicinity is shown in *Figure F3.1*.

Figure F3.1 Road Network in Gaziantep



Source: General Directorate of Highways

F3.1.1 *Overview of Public Transport in Gaziantep*

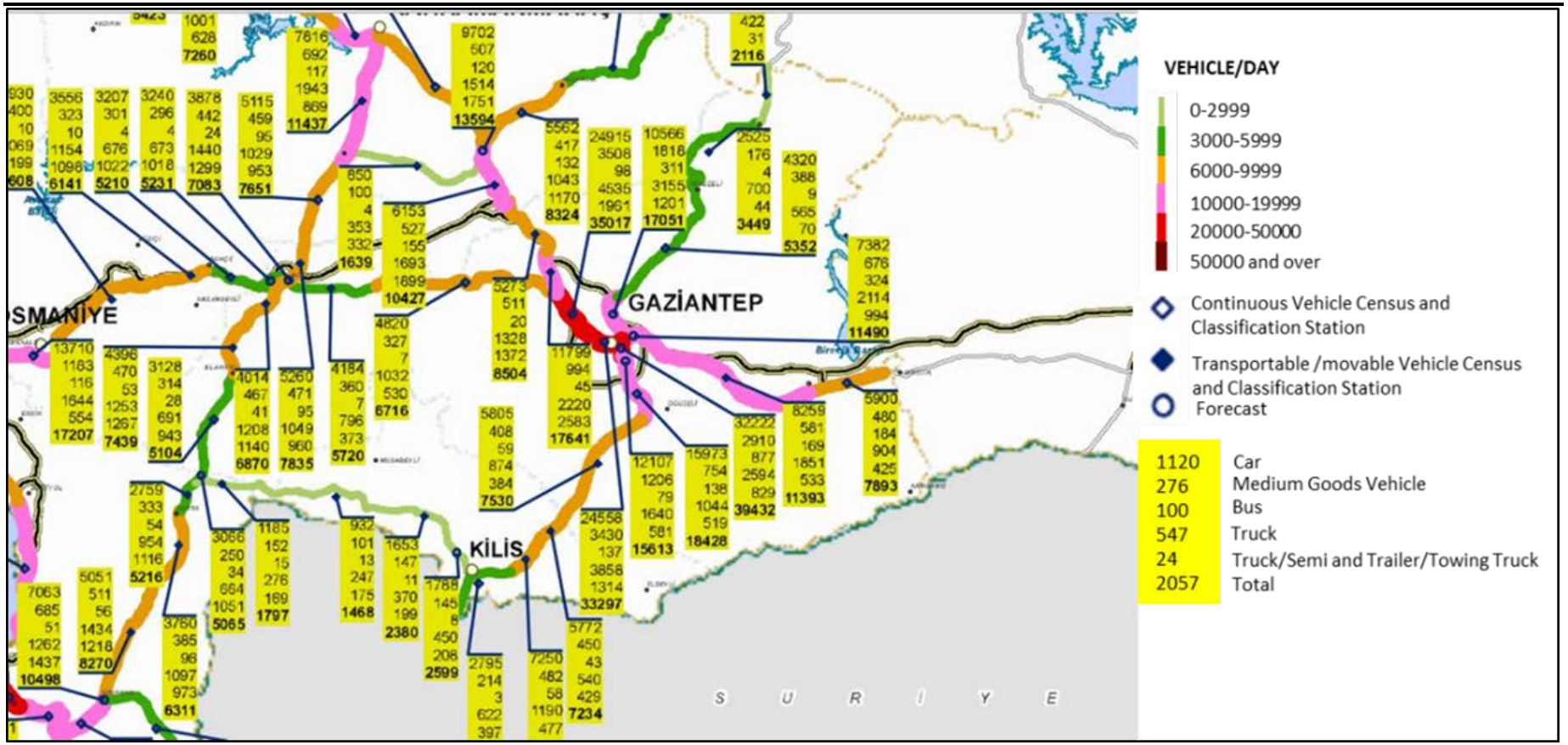
Gaziantep Province is accessible from other cities by several public transport alternatives. These include intercity buses, railway connections and flights to and from Gaziantep International Airport. In addition, the neighbourhoods of Gaziantep province are accessible by different means of public transport alternatives. There are buses, tram lines and an aerial cableway connection within Gaziantep Province. The details of public transport conditions are provided in *Section F3.2*.

F3.1.2 *Existing Road Traffic Conditions in Gaziantep*

The annual average daily traffic values on the roads around Gaziantep are shown in *Figure F3.2*. *Figure F3.3* illustrates the annual average daily traffic values on the motorways in and around Gaziantep.

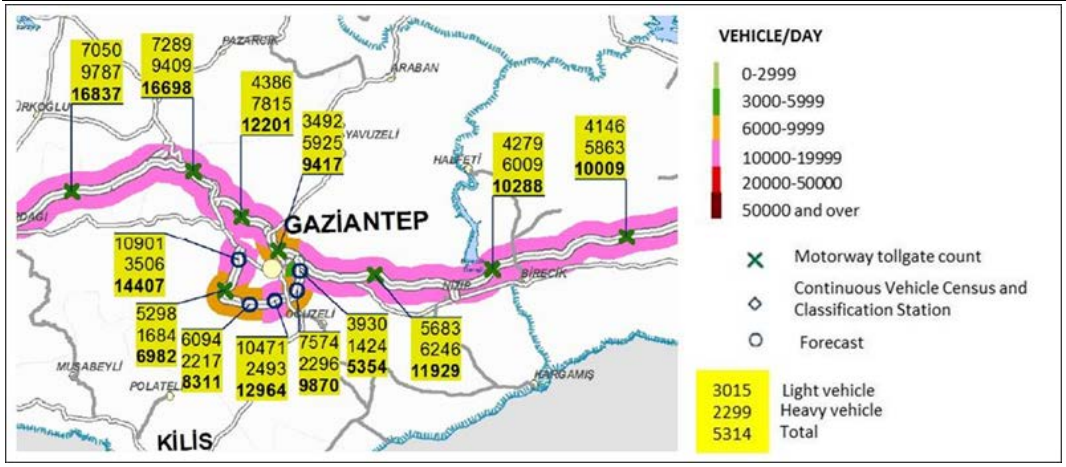
Figure F3.4 shows the road network around the City, and illustrates that Gaziantep is accessible from surrounding cities (Osmaniye from the west, Kilis from the south, Kahramanmaraş from the north and Şanlıurfa from the east).

Figure F3.2 Annual Average Daily Traffic Values on State Roads in and around Gaziantep



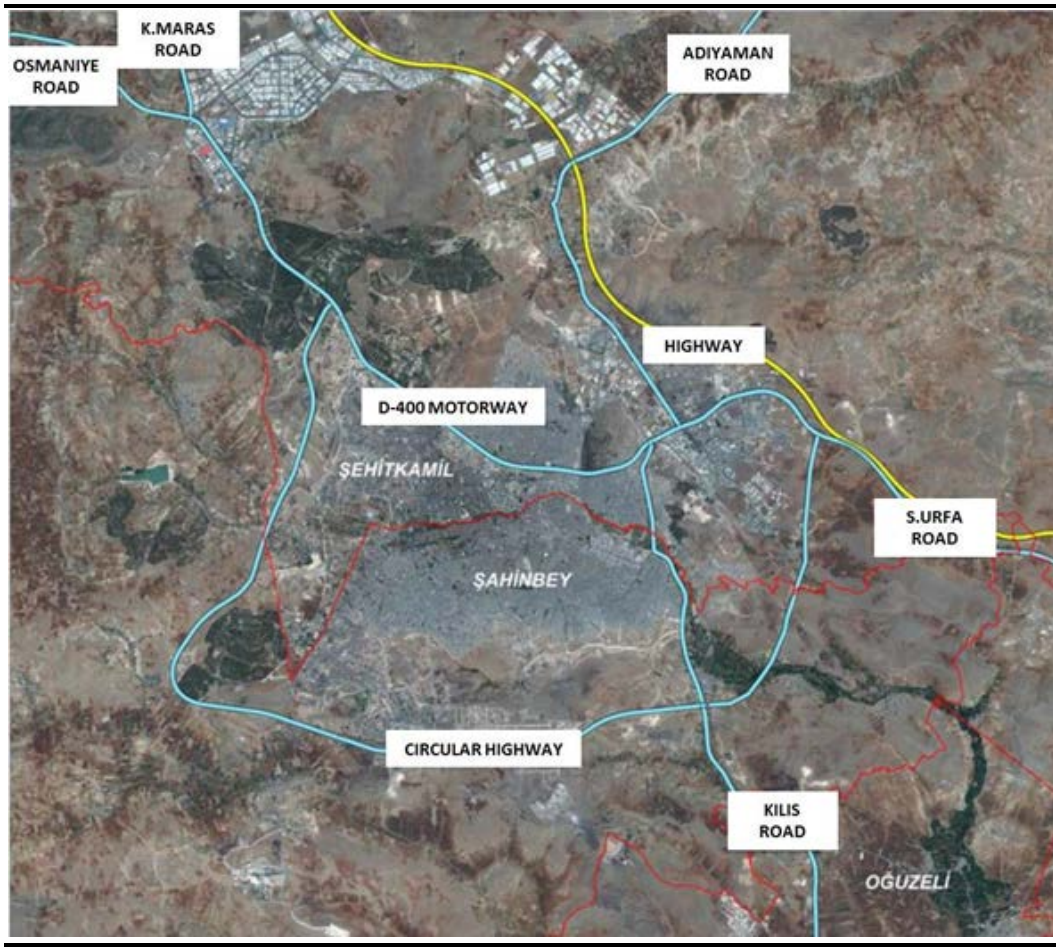
Source: 2014 Motorways and State Roads Traffic Flow Map, General Directorate of Highways, Department of Traffic Safety, Division of Transport Surveys, June 2015

Figure F3.3 Annual Average Daily Traffic Values on Motorways in and around Gaziantep



Source: 2014 Motorways and State Roads Traffic Flow Map, General Directorate of Highways, Department of Traffic Safety, Division of Transport Surveys, June 2015

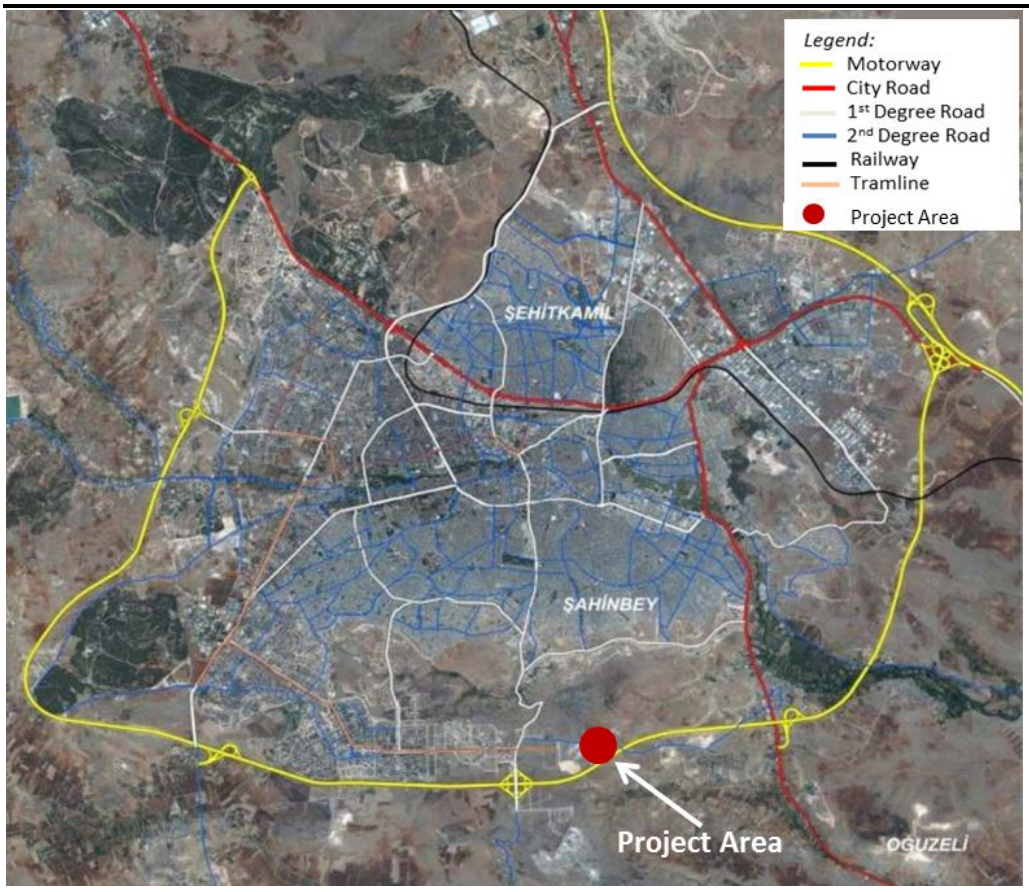
Figure F3.4 Road Network around Gaziantep



Source: Gaziantep Metropolitan Municipality, Department of Transportation Planning and Rail Systems

Urban development in the city of Gaziantep is concentrated in Şehitkamil District and Şahinbey District (where the Project Site is located). There are 314 km of state highways, 148 km of motorways and 187 km of provincial roads (which makes 649 km in total) within the administrative borders of Gaziantep. The main transportation infrastructure in and around Gaziantep City is shown in *Figure F3.5*.

Figure F3.5 Gaziantep Transportation Network



Source: Gaziantep Metropolitan Municipality, Department of Transportation Planning and Rail Systems

F3.1.3 Main Roads

The traffic load in Gaziantep in 2014 was reported as 674,885,000 car/km for highways and 1,085,032,000 car/km for state roads (1). The Gaziantep – Şanlıurfa Motorway (D400) is the most crowded road in the City, followed by the Gaziantep – Kilis Motorway (D850). The Project Site is located approximately 6km south of the Gaziantep-Şanlıurfa Motorway (D400), 3 km north of the Gaziantep Motorway (O-54) and 3.5 km west of the Gaziantep-Kilis Motorway (D-850).

The Project Site and the City centre are connected by three routes:

- From the City centre via Özdemir Street which runs in a north-south direction and is currently being expanded from two lanes to six. The

(1) Source: General Directorate of Highways, 2014 Motorways and State Roads Traffic Flow Map, General Directorate of Highways, Department of Traffic Safety, Division of Transport Surveys, June 2015

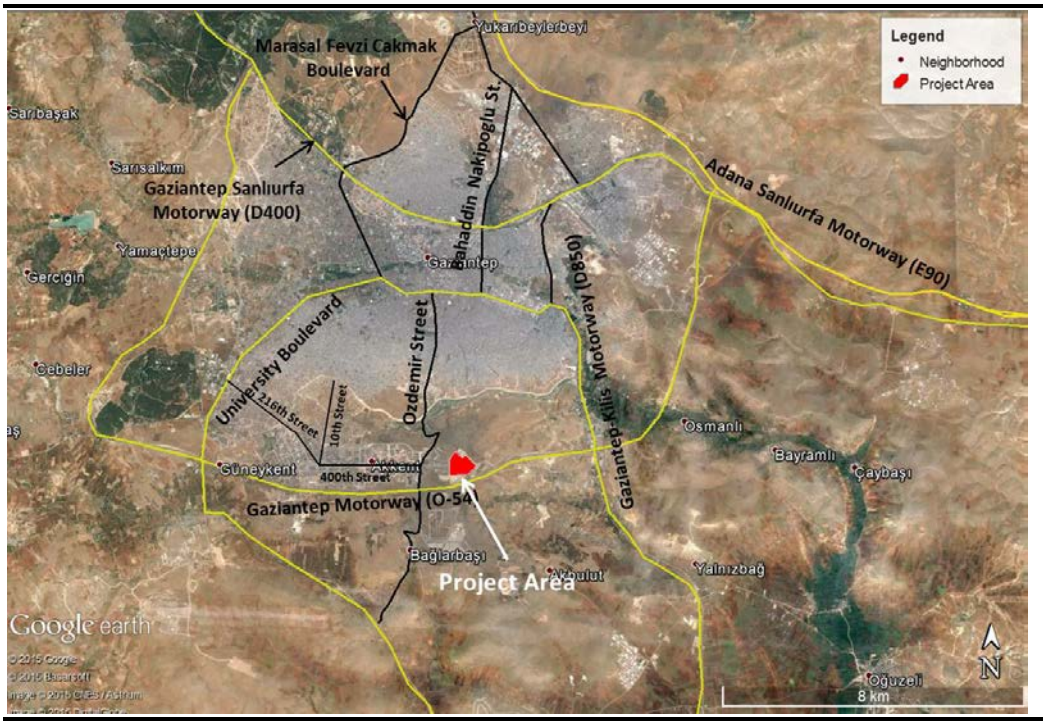
Project Site is accessible by following Özdemir Street until the clover leaf junction and turning left from Özdemir Street. The Project Site is located approximately 80 m away from the clover leaf junction.

- From Gaziantep University, following University Boulevard and Halep Boulevard, turning left until reaching the clover leaf junction then turning left from the junction. The road network around the Project Site is shown in *Figure F3.6*.

- From the west via 400th Street (2x2 lanes). This street is connected to University Boulevard and City centre through 216th street and 10th Street, respectively.

The Project Site is accessible from the airport along the Gaziantep-Kilis Motorway (D850) and then following the Gaziantep Motorway (O-54).

Figure F3.6 Road Network around Project Site



Notes: Red area indicates the Project Site, yellow lines are motorways, black lines are city roads.
Source: Map prepared based on information obtained from Gaziantep Metropolitan Municipality, Department of Transportation Planning and Rail Systems

F3.1.4 Traffic Counts

Within the scope of the Interim TIS, a traffic count was conducted at the junction between Özdemir Street and 400th Street on 17th February 2016. The traffic count was conducted in order to assess peak hour car units (CU) (1) during morning, afternoon and evening hours. The traffic count was conducted in 15 minute intervals and the consecutive four maximum counts

(1) Measures are converted to 'per car unit' by using coefficient as 1 for automobile/panelvan, 1.5 for Service bus/minibus, 2 for midibus, 2.5 for bus, 3 for truck and 0.5 for motorbike.

were determined as the peak hour car unit for the section. The results obtained at the traffic count location are set out below.

- Morning peak hour occurs between 07:30 and 08:30 and total traffic volume is 4,187 CU. The traffic volume in the direction of Akkent – Motorway was counted as 1,201 and the traffic volume from Özdemir Street to the Motorway which was counted as 1,158. The south exit of the junction (ie Location 4 as illustrated in *Figure F3.7*) has the highest traffic volume with 2,501 CU.

- Noon peak hour occurs between 12:30 and 13:30. Total traffic volume at the junction is 2,640 CU. In the direction of Özdemir Street to the motorway, the traffic volume was counted as 529 CU, while it was counted as 462 CU in the direction of west to south (ie from 400th Street to the motorway). The south exit of the junction (ie Location 4 as illustrated in *Figure F3.7*) has the highest traffic volume with 1,156 CU.

- Evening peak occurs between 17:15 and 18:15. Total traffic volume is 2,994 CU. The traffic count in the direction of the motorway to Akkent was 729 and from Özdemir Street to the motorway it was 520. The west exit (ie Location 1 as illustrated in *Figure F3.7*) of the junction has the highest traffic volume with 1,178 CU.

Figure F3.7 Location of Traffic Counts

F3.2 EXISTING PUBLIC TRANSPORT CONDITIONS IN GAZIANTEP

F3.2.1 Bus Network

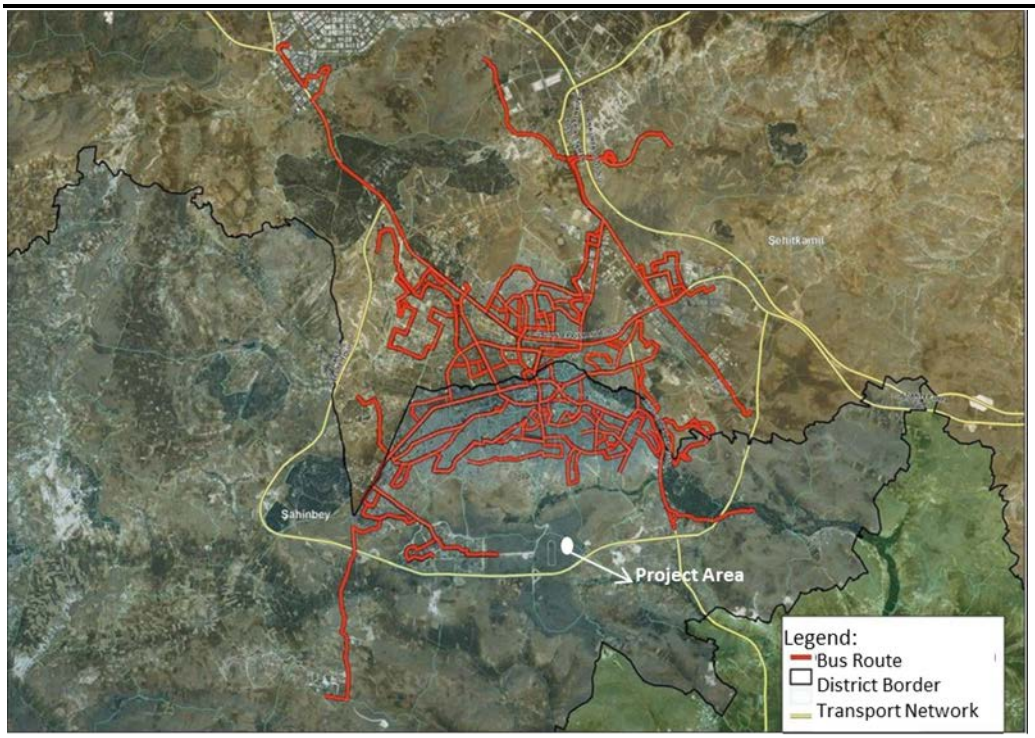
Gaziantep Province is also accessible by intercity busses from other cities. Gaziantep Main Intercity Bus Terminal is located in Karacaahmet Neighborhood to the north of the City center (see *Figure F3.8*). In addition, there are three smaller bus terminals, Şahinbey Village Bazaar Rural Bus Terminal, 1st Rural Bus Terminal and 2nd Rural Bus Terminal. The 1st and 2nd Rural Bus Terminals are located to the north of the Project Site whereas Şahinbey Rural Bus Terminal is located to the north-west of the Project site (see *Figure F3.8*).

Figure F3.8 Location of the Intercity Bus Terminals in Gaziantep

Source: The approximate location of bus terminals is retrieved from the Gaziantep Metropolitan Municipality, Department of Transportation Planning and Rail Systems.

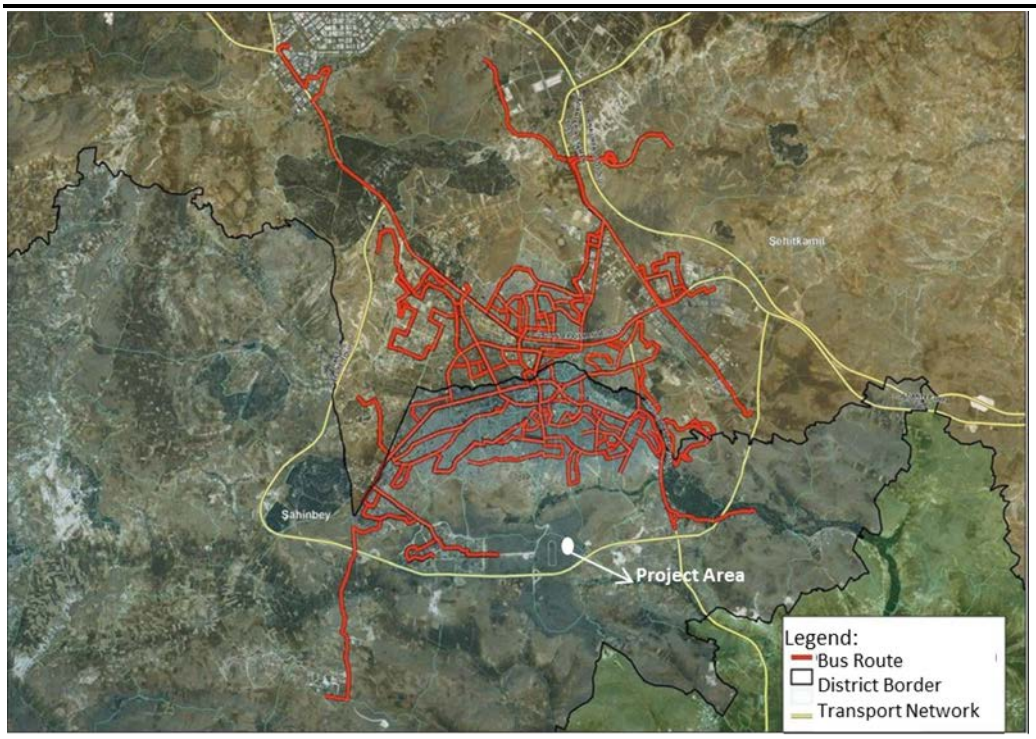
Within Gaziantep there are municipality-owned buses, privately-owned public buses, yellow buses (formerly these were minibuses, now under the responsibility of the municipality) and rural (outer city) line buses. There is bus transportation from Gaziantep City centre to Akkent neighbourhood (the closest location to the Project Site). The transportation routes for municipality buses and privately owned public buses are shown in *Figure F3.9* and *Figure F3.10*.

Figure F3.9 Municipality Bus Routes



Source: Gaziantep Metropolitan Municipality, Department of Transportation Planning and Rail Systems

Figure F3.10 Private Bus Routes



Source: Gaziantep Metropolitan Municipality, Department of Transportation Planning and Rail Systems

The SPV has made an application to the Gaziantep Metropolitan Municipality, Department of Transportation Planning and Rail Systems to obtain information on public transport services to the Project Site. The official response letter from Gaziantep Metropolitan Municipality, Department of Transportation Planning and Rail Systems dated 19.01.2015 states that, there are currently no public transport services directly to the Project Site and this issue is under planning to ensure that public transport services will be in place prior to the Project being operational. Currently, the closest bus station to the Project Site is 3 km to the south.

However, information set out in the Interim TIS, outlines that there are nine different bus routes to the vicinity of the Project Site. It is therefore likely that additional bus stops may be located on these bus routes nearer the Project site when the IHC is operational.

F3.2.2 Gaziantep International Airport

Gaziantep has an international airport located towards the south east of the City centre and approximately 9 km from the Project Site (see *Figure F3.11)*.

Figure F3.11 Location of Gaziantep Airport

F3.2.3 Railway and Tramway Line

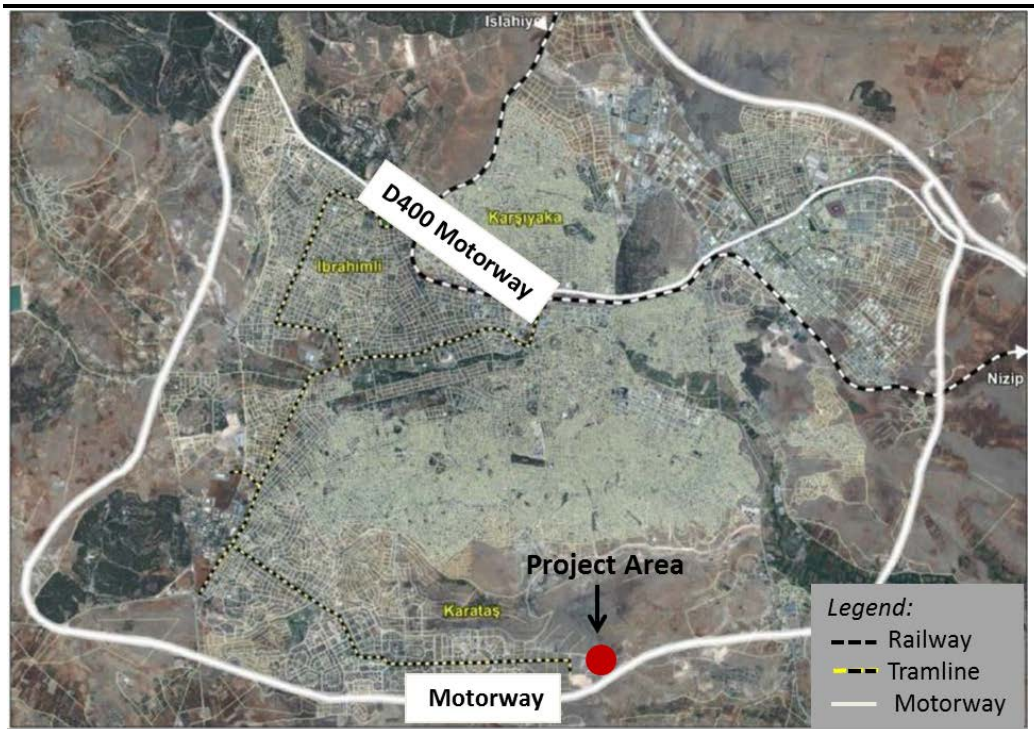
The Turkish State Railway Line (TCDD) has an important role in Gaziantep. The Railway Station was built in 1954 and has become a major hub in the southeast for trains traveling between Baghdad, Adana, Halep, and Malatya. The Railway Station is illustrated in *Figure F3.13*.

In addition, there are two tramlines operating in the city. The Akkent-Railway Station tramline ends approximately 1.7 km from the Project site. Based on the Interim TIS, the Akkent – Railway Station tram line is expected to meet the bulk of the public transportation demand of the IHC. This line has been operational since 2010 and its total length is reported as 14.8 km. The tramway operates at full capacity during the peak hours (ie 15:00-16:00). The daily average number of passengers using the tramway is 56,849. According to *Figure F3.13*, there are plans to construct an additional station within approximately 150 m of the Project site and is expected to be operational when the IHC starts operation. The overnight tramcar parking area /depot is located to the south of the Gaziantep IHC site.

The railway and tramway network are shown in *Figure F3.12*.

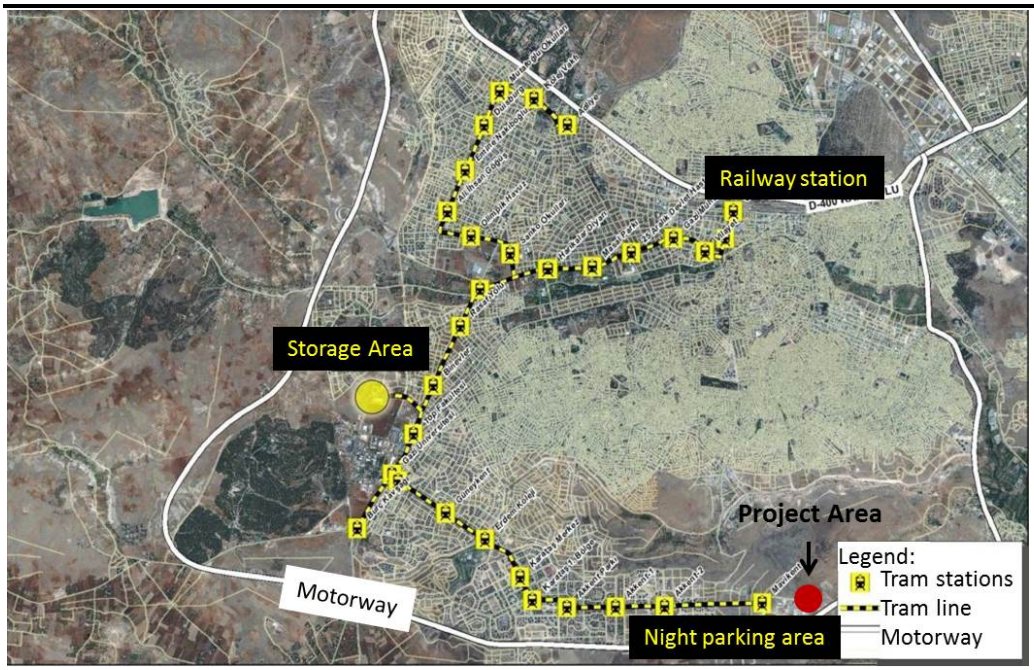
Figure F3.13 also shows the tram network together with the locations of stations.

Figure F3.12 Railway and Tram Network



Source: Gaziantep Metropolitan Municipality, Department of Transportation Planning and Rail Systems

Figure F3.13 Tramway Network and Stations



Source: Gaziantep Metropolitan Municipality, Department of Transportation Planning and Rail Systems

F3.2.4 Aerial Cableway Line

There is an aerial cableway within Şahinbey public garden located between Karataş, Yeditepe, Güneykent and Şahintepe neighborhoods in Şahinbey District at a distance of approximately 5 km to the Project site. The aerial cableway provides services for a 950 m distance (one-way trip) and passenger capacity of 1,000 people per hour. The location of the cableway is shown in *Figure F3.14* below.

Figure F3.14 Location of Aerial Cableway

F3.3 ROAD IMPROVEMENTS

The Project Site is included in the local zoning plan (1/1,000 (1) and 1/5,000 (2) scaled zoning plans) as a 'health facility area', in an area that is under development. The local zoning plan highlights three major road improvements/developments that will enable easier access to the Project site. These include:

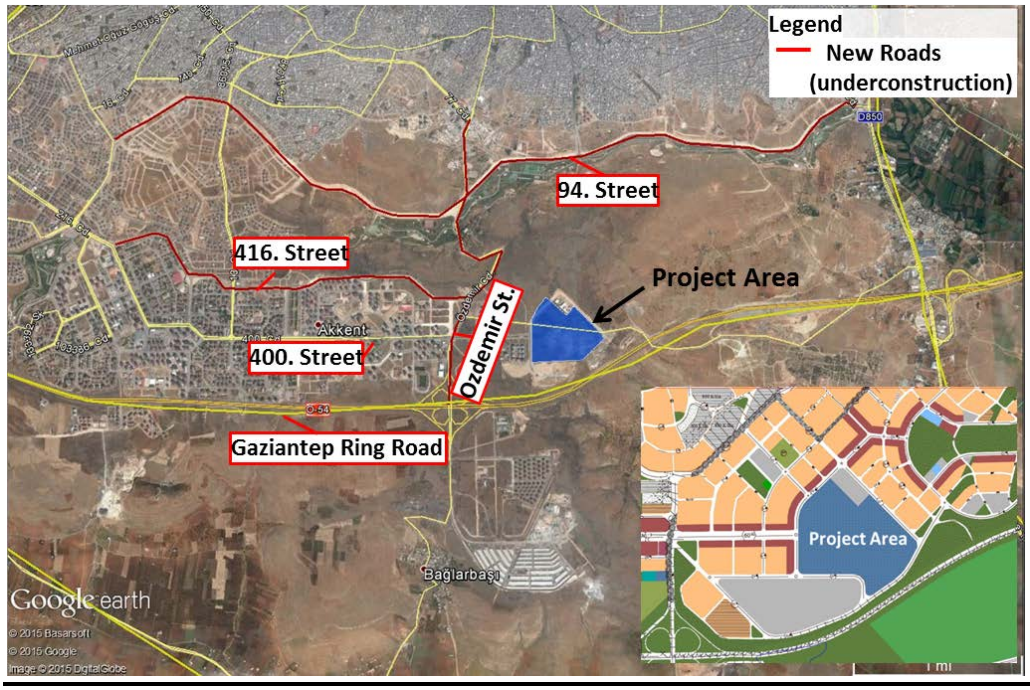
- Expansion of Özdemir Street which connects the Project Site with the city centre: this is currently being expanded from two lanes to six by Şahinbey Municipality in coordination with the Gaziantep Metropolitan Municipality.

- A new road (already partly built, named as 94th Street) located to the north of the Project Site: this is under development in a west-east direction. This new road will have a minimum of seven junctions that lead to roads with direct access the Project Site.

- A new road (already partly built, named as 416th Street): this is being developed in Karataş neighborhood. The intention is that this development will reduce traffic density on 400th Street (that is directly connected to the Project Site).

The above mentioned road developments are illustrated in *Figure F3.15* and *Figure F3.16*.

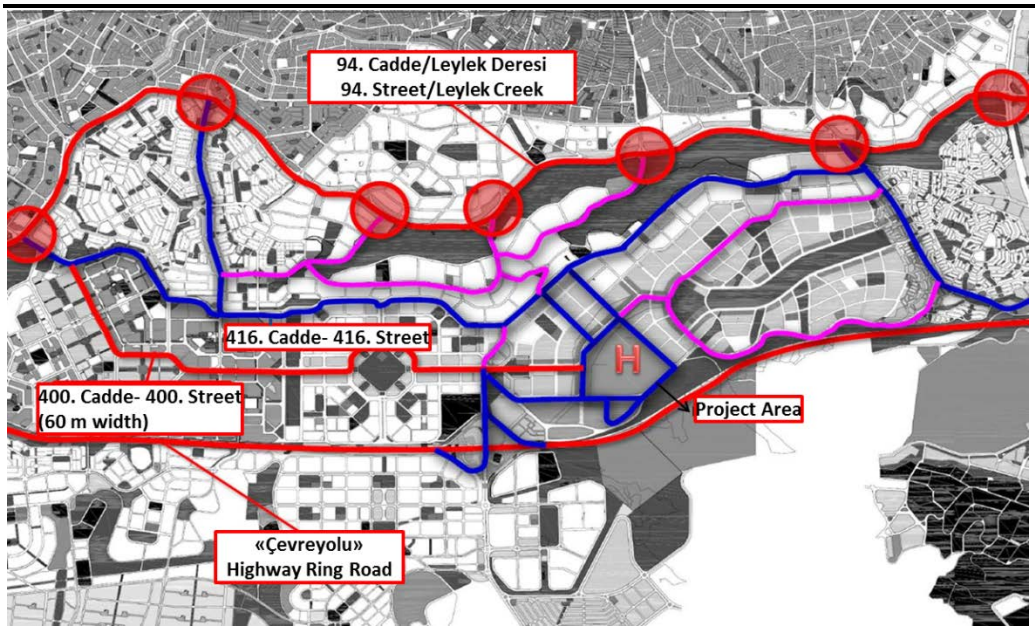
Figure F3.15 Future Road Improvements/Developments in the Vicinity of the Project Site



(1) Şahinbey Municipality, obtained during face to face meeting with the Mayor
(2) Source: Gaziantep Metropolitan Municipality, Directorate of City Planning, Housing and Urban Planning Department

Source: The bottom right picture is 1/5,000 scaled Master Plan for Gaziantep (Received on July 2015 during meeting with Housing and Urban Planning Department, Directorate of City Planning).

Figure F3.16 New 94th and 416th Roads



Source: Gaziantep IHC New Site Plot / Master Plan Update 25/03/2015

In addition to the road developments currently ongoing as part of the local zoning plan (94th and 416th Roads), new 30 m wide roads surrounding the Project Site are proposed. At a wider scale (beyond the local zoning plan), there are additional road projects underway and in planning by the General Directorate of Highways to improve existing inner city and intercity roads around Gaziantep.

F4 IMPACTS

F4.1 TRAFFIC GENERATED DURING CONSTRUCTION

A Construction Traffic Management Plan was prepared by the SPV in order to outline specific measures that will be applied to manage traffic conditions in the Project Site during the construction phase.

The daily traffic movements estimated for the key construction activities are:

- 200 trucks per day in the first 4 months for earthworks;
- 90 transport concrete mixers per day for the first year of concrete works;
- 70 trucks per day for materials mainly after the first year; and
- 150 cars of permanent staff, per day from 6th month to 30th month.

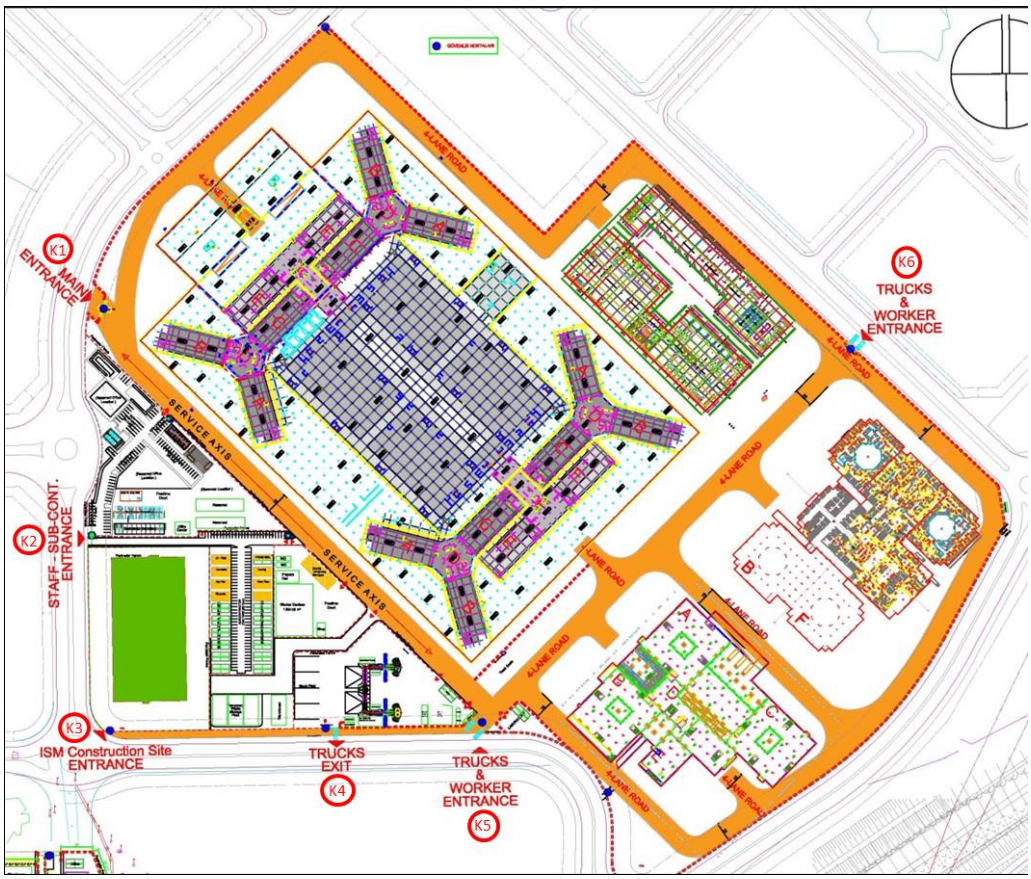
There will be six gates to be used during the construction phase as shown in *Figure F4.1* that will allow construction and operational personnel to enter the premises. These gates are as follows:

- K1 – Main entrance for concrete mixers, until the Concrete Batching Plant is operational;
- K2 – Technical staff entrance;
- K3 – ISM Construction site entrance for ISM staff and vehicles;
- K4 – Exit gate for heavy goods vehicles;
- K5 – Entrance gate for heavy goods vehicles; and
- K6 – Emergency exit gate.

In order to organise the transportation of materials, workers, equipment and vehicles, internal temporary access roads will be constructed on site. The creation of a perimeter road to surround the footprints of the buildings will allow access to all construction areas.

Additionally, a dedicated safe area and pathways of a suitable width will be constructed for personnel circulation in parallel to the internal site roads. There will also be a dedicated car parking area inside the Project site for private cars of authorised personnel.

Figure F4.1 Location of Gates and Haulage Routes during Construction



The Construction Traffic Management Plan includes detailed safety measures for: the internal road network; traffic signals; site access control; personnel working on site; traffic control mitigation measures; internal traffic management; off-site traffic management; regular training; and road and vehicle maintenance.

The Construction Traffic Management Plan sets out the following measures to manage the off-site traffic in order to minimise the impacts on sensitive receptors in the vicinity, in particular TOBB High School and residential areas.

- All the students in TOBB High School will be given traffic safety seminars once a month;
- The passage of heavy goods vehicles will be minimised around TOBB High School at the times of the day the students are expected to be using the surrounding roads (eg. school entrance and exit hours);
- There will be signs placed at every 300 m around the Project site stating the relevant contact details for any potential grievances to be communicated to the Project;
- All operators of construction vehicles will be given educational seminars on traffic safety; and

- Information brochures (which include the relevant contact details for any potential grievances to be communicated to the Project) will be distributed to all the residential buildings and to the Muhtar of the surrounding neighbourhoods.

According to data provided by the SPV, heavy goods vehicles will enter and exit the site from the south gates (ie K4 and K5) in order to avoid the TOBB High School as much as possible. The SPV is also planning to complete excavation works during the school summer holiday period, which commenced on 17th of June and continues through to September 2016.

During construction the production of concrete will require cement, aggregate and water to be transported to the Concrete Batching Plant located at the Project site. It is understood that concrete production on site will be required for approximately one year between April 2016 and April 2017. The average daily number of vehicles required to transport these materials are:

- aggregate deliveries vary between 10 to 196, and are highest between June and October 2016, with peak of daily movements of 196 in July;

- cement deliveries vary between 2 to 33 and are highest between June and October 2016, with peak of daily movements of 33 in July; and

- water deliveries vary between 1 to 21 and are highest between June and October 2016, with peak daily movements of 21 in July.

The Construction Traffic Management Plan notes that that the concrete batching plant would not be completed in April 2016 in time for proposed construction to commence; therefore, in the meantime, ready mixed concrete will be brought to the construction site from outside the Project site using concrete mixers. It is planned to have 30 mixers daily on average to come to the site for this period.

The excavation wastes that will be generated during construction will be transported to an Excavation Materials Disposal Site. The disposal site is located 4.2 km to the south of the Project site. The location of the disposal site, together with the routes that the trucks will follow is illustrated in *Figure F4.2*.

Figure F4.2 *Location of the Excavation Waste Disposal Site and its Access Route from the Project Site*

F4.2 POTENTIAL IMPACTS DURING CONSTRUCTION

During construction, activities including transport of construction materials to the Project site and travel to/from Project site by construction workers and other personnel will generate additional traffic load on the existing road network near the Project site. The Project site is accessible through Gaziantep-Kilis Motorway (D-850) following the Gaziantep Motorway (O-54). The Project site and City centre are connected by Özdemir Street which is currently being expanded from two lanes to six lanes. It is expected that the heavy goods vehicles during construction will use the O-54. As explained previously, the area around the Project site is currently under development where there are currently limited numbers of residential buildings and adjacent school buildings; therefore, the existing traffic levels are considered as low (see *Section 1.3.1)*.

The traffic count study conducted at the junction between Özdemir Street and 400th Street on 17th February 2016 showed that

- Morning peak hour occurs between 07:30 and 08:30 and total traffic volume is 4,187 CU.
- Noon peak hour occurs between 12:30 and 13:30. Total traffic volume at the junction is 2,640 CU.
- Evening peak occurs between 17:15 and 18:15. Total traffic volume is 2,994 CU.

During construction, in the worst case scenario, where it is assumed that excavation trucks, concrete mixers, trucks for materials and staff cars will operate at the same time, the daily traffic generation resulting from the construction activities will be 510 vehicles. It is stated by the SPV that the construction activities will run for a maximum of 20 hours per day, which results in an hourly traffic generation of 26 vehicles. The traffic count suggests that the baseline traffic flow at the closest junction to the Project site during morning, noon and evening peak hours are 4,187, 2,640 and 2,994, respectively. To this end, it can be concluded that the construction traffic, will cause a maximum of 1 % increase in the existing traffic conditions in the region.

The road network in the vicinity of the Project site is currently being further developed (eg. expansion of Özdemir Street and the construction of other new roads). Based on this, these roads are considered to have a good capacity to absorb temporary increases in traffic during the construction phase. Therefore, the sensitivity of the existing residential areas and schools along the roads to these changes in traffic is taken as low. Taking into account of the low increase in the baseline traffic levels in the area (ie approximately 1%), the magnitude of impact is expected to be small in terms of traffic increase. As such, the impacts would be of negligible significance in terms of the capacity of the road network.

F4.3 TRAFFIC GENERATED DURING OPERATION

An Interim Traffic Impact Study (TIS) was conducted by technical consultants for the SPV to:

(i) evaluate the existing transportation network;
(ii) conduct a traffic demand assessment and internal access system planning and simulation for the Project site; and
(iii) plan the entrance and exit routes of the car parks.

F4.3.1 *Traffic Load Estimations*

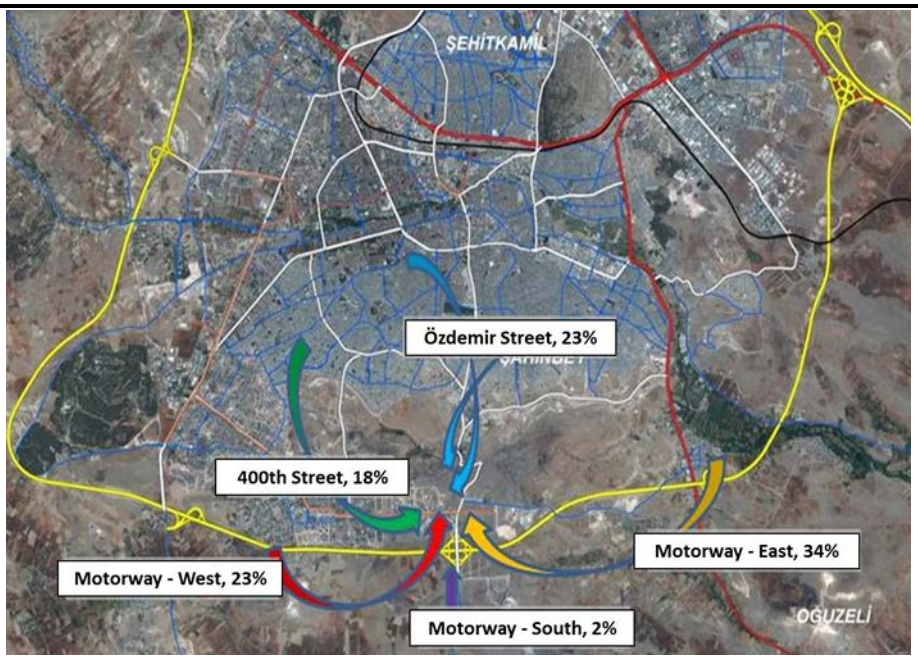
The number of daily users of the Gaziantep IHC (expressed in numbers of people) is presented in *Table F4.1.*

Table F4.1 Number of Daily Users of Gaziantep IHC

Number of Gaziantep IHC Users (people)	
Inpatients (based on 100% occupancy rate)	1,875
Outpatients coming to polyclinics	17,705
Patients coming to emergency	1,500
People accompanying outpatients	1,420
People accompanying inpatients	21,010
Visitors	3,850
Total visitors and patients	**47,360**
Number of Gaziantep IHC Personnel (people)	
Medical Personnel (latest information from MoH)	3,060
Service Personnel	2,500
Total Personnel	**5,560**
Total Daily Users of IHC	**52,920**

The number of daily trips to Gaziantep IHC during operation phase has been estimated taking into account the daily number of IHC users and IHC's area of influence which is considered to be the whole Gaziantep City (as defined in *Section 1.1.3)*. The population of all districts within Gaziantep has been considered in estimating the number of daily trips to IHC. It is found that 38% of IHC users will come from the central Gaziantep (i.e. Şehitkamil district) and 46% will come from the districts from the southern direction (i.e. Şahinbey and Oğuzeli). In addition, 5%, 3%, and 8% of the IHC users will come from the western, northern and eastern districts, respectively (*Figure F4.3*).

Figure F4.3 Traffic Load Estimations



The interim traffic report highlights the following for the estimation of the daily hospital traffic:

- Most of the hospital personnel will start working in the morning. Some of the hospital personnel will work in shifts. Accordingly, the majority of travel for hospital personnel will arrive between 07:00-08:00 and depart between 17:00-18:00.

- Outpatients and their accompanying them, will mainly come to the IHC during the morning which is related to the opening hours of the analytical services and departments. Due to the fact that hospitals provide service by appointment, the demand outside of the morning hours will be evenly distributed throughout the day.

- Inpatients will predominantly arrive during the morning hours and stay at the IHC for an average of four days before leaving in the middle of the day following consultation with the doctors. Inpatients' visitors will predominantly arrive at the IHC during in the middle of the day and evening (between 13:00-14:00 and between 18:00-19:00).

- 12.8% of the total travel (i.e. two-ways) will occur during the morning peak (08:00-09:00) of which 68% will be travelling in the direction towards the IHC. It is expected that 46% and 54% of the hospital personnel will arrive to IHC by private car and public transport, respectively. It is expected that 67% and 33% of patients and visitors will arrive to IHC by private car and public transport, respectively.

Based on the above assumptions, a total of 40,489 daily trips (1) (including both private car and public transport) are envisioned to occur at the IHC area and its surroundings. It is found that 39,743 (98%) daily trips will be made by private car. As a result, a total of 105,840 one way movements are made daily (52,920 daily users making two-way trips). The distribution of use of private car and daily trips for hospital are presented in *Table F4.2* and *Table F4.3*.

Table F4.2 Distribution of use of Private Cars

Daily Transportation			Peak Hour*			Peak Hour *		
Staff	**Visitors**	**Total**	**Staff**	**Visitor**	**Total**	**Incoming**	**Outgoing**	**Total**
13%	87%	100%	21%	79%	100%	68%	32%	100%
5,064	34,679	39,743	1,089	3,988	5,077	3,462	1,615	5,077
						Public Cars travel during peak hour* (two-way)		**5,077**
*Based on demand calculations, peak hour is determined as morning time between 08:00-09:00 during the weekday.								

(1) A trip is a two-way movement to and from the IHC.

Table F4.3 Distribution of Daily Trips

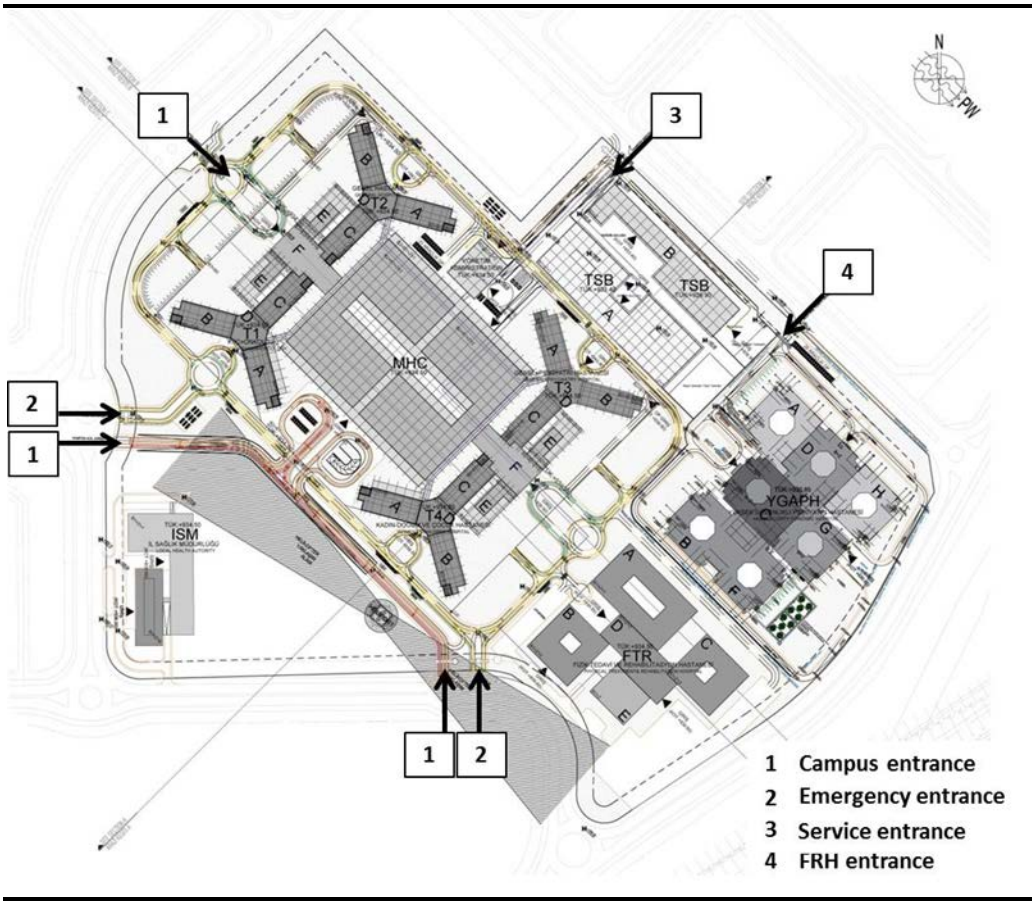
Mode	Private-Public Transportation (Daily)		Occupancy Rate	Private-Public Transportation (Peak Hour)		Occupancy rate
	Vehicle	People Movements	People/ vehicle	Vehicle	People Movements	People/ vehicle
Public transport	746	37,314	50	70	4,897	70
Private car	39,743	68,526	1.72	5,077	8,387	1.65
Daily vehicle travel (two-way)						**40,489**
Vehicle travel during peak hour* (two-way)						**5,147**
*Based on demand calculations, peak hour is determined as morning time between 08:00-09:00 during the weekday.						

F4.3.2 Access and Internal Road Network

The internal road system within the IHC, the identified locations of the exits and entrances, routes for different types of users (i.e. emergency patients, visitors, service vehicles etc.) were evaluated within the scope of the Interim TIS.

According to the Interim TIS, arrangements may need to be made to ensure that the conditions of the roads near the emergency exits are adequate in order to provide safe access to the IHC site. The Interim TIS also states that the emergency entrances and general campus entrances should be clearly separated from each other in order not to create any confusion by different user groups. These issues will be evaluated in detail within the scope of the Final TIS.

Figure F4.4 Location of Entrance and Exit gates to the Gaziantep IHC



F4.3.3 Parking

Indoor car parking provision includes 3,175 spaces spread across two basement levels in the Main Hospital and Rehabilitation Hospital. There are an additional 677 outdoor parking spaces including 250 spaces for the Main Hospital, 297 spaces for the Rehabilitation Hospital, 10 spaces for the Forensic Hospital, and 120 spaces for the IHSM building and 27 spaces for technical functions.

F4.4 POTENTIAL IMPACTS DURING OPERATION

During the operation of the health campus there will be considerable additional traffic load on the existing road network near the campus site. According to the findings of the Interim TIS, total daily users of IHC will be 52,920; and the model simulation revealed that the peak hour occurs between 08:00-09:00 (with a maximum two-way flow of 5,077 cars). The Interim study predicted the following distribution of traffic load originating from private cars.

Table F4.4 Distribution of Traffic Load

Hours	Inbound Traffic	Outbound Traffic	Total Traffic
06:00-07:00	0	0	0
07:00-08:00	2400	524	2924
08:00-09:00	3462	1615	5077
09:00-10:00		1907	4414
10:00-11:00		2120	4027
11:00-12:00	1561	2254	3815
12:00-13:00	1387	1734	3121
13:00-14:00	1734	1734	3468
14:00-15:00	1561	1561	3122
15:00-16:00	867	1247	2114
16:00-17:00	347	1247	1594
17:00-18:00	520	1533	2053
18:00-19:00	1040	1296	2336
19:00-20:00	376	897	1273
20:00-21:00	203	203	406
21:00-22:00	0	0	0
22:00-06:00	0	0	0
Total	**19872**	**19872**	**39744**

This estimation is based on the assumption that some public transport alternatives to travel to the IHC will be available.

As it is stated in the Interim TIS, 59 % of this load will originate from the motorway (i.e. a total of 23,449 trips), 23 % will come from the direction of Özdemir Street (i.e. a total of 9,141 trips) and 18% will come from the 400th Street (ie a total of 7,154 trips). The breakdown of the above table into these percentages as well as the breakdown of the traffic count conducted on 17th February along these roads are shown in *Table F2.1* below.

Table F4.5 Breakdown of Traffic Generated during Operation

Hours	400 Street CPU (18%)	Existing Traffic Count	Change %	Özdemir Street (23%)	Existing Traffic Count	Change %	O-54 Ring Road Connection (59%)	Existing Traffic Count	Change %
06:00-07:00	0	0	0	0	0	0	0%	0	
07:00-08:00	526	534	99	673	853	79	1725	2501	69
08:00-09:00	914	534	171	1168	853	137	2995	2501	120
09:00-10:00	795	534	149	1015	853	119	2604	2501	104
10:00-11:00	725	534	136	926	853	109	2376	2501	95
11:00-12:00	687	645	106	877	617	142	2251	1156	195
12:00-13:00	562	645	87	718	617	116	1841	1156	159
13:00-14:00	624	645	97	798	617	129	2046	1156	177
14:00-15:00	562	645	87	718	617	116	1842	1156	159
15:00-16:00	381	645	59	486	617	79	1247	1156	108
16:00-17:00	287	645	44	367	617	59	940	1156	81
17:00-18:00	370	1178	31	472	630	75	1211	969	125
18:00-19:00	420	1178	36	537	630	85	1378	969	142
19:00-20:00	229	1178	19	293	630	46	751	969	78
20:00-21:00	73	1178	6	93	630	15	240	969	25
21:00-22:00	0	0	0	0	0	0	0	0	0
22:00-06:00	0	0	0	0	0	0	0	0	0
Total	7154			9141			23449		

The magnitude of change in traffic flows along these roads indicate that is large (increase of over 50%) in road traffic but still within the design capacity of the transport system. It should be noted that this is a worst case assumption that does not consider the use of the public transport network.

The sensitivity of the receptors should be considered as low to medium considering that a wide road network will be developed in the area. As previously indicated these include:

- Expansion of Özdemir Street which connects the Project Site with the city centre: this is currently being expanded from two lanes to six by Şahinbey Municipality in coordination with the Gaziantep Metropolitan Municipality.

- A new road (already partly built, named as 94th Street) located to the north of the Project Site: this is under development in a west-east direction. This new road will have a minimum of seven junctions that lead to roads with direct access the Project Site.

- A new road (already partly built, named as 416th Street): this is being developed in Karataş neighbourhood. The intention is that this development will reduce traffic density on 400th Street (that is directly connected to the Project Site).

As such, the impacts would be of **moderate** to **major** significance in which is based on a worst case scenario transport by private care with limited/no travel by public transport.

The Interim TIS evaluated the design of the health campus site and the identified entrances and exits for different types of users. It was concluded in the Interim TIS that there might be need for additional arrangements in the conditions of the entrance and exit roads to the campus, particularly related with the emergency users. These conditions will be further evaluated in the final TIS and final TIS will ensure that the internal road network is designed to minimise congestion, queuing and idling vehicles, ensure that public footpaths and walkways are adequate and the entrances/exits will be designed appropriately, in particular in relation to emergency users.

F5 MITIGATION MEASURES

F5.1 CONSTRUCTION MITIGATION MEASURES

The SPV has already developed a Construction Traffic Management Plan to be implemented during the construction phase. The Construction Traffic Management Plan includes specific safety measures for the internal road network, traffic signals, site access control, personnel working on site, internal traffic management, off-site traffic management, implementation of regular training, road and vehicle maintenance. In addition, the Construction Traffic Management Plan requires the SPV to inform and cooperate with the Transportation Coordination Centre of Gaziantep Metropolitan Municipality to the extent possible, and incorporate adequate signals, selection of alternative routes, announcement of time intervals when considerable heavy goods vehicle movements will occur within the city (eg. for the transport of material and/or over-sized machinery to/from the site). Moreover, the effectiveness of the Construction Traffic Management Plan will be reviewed at least once a month or more frequently if additional risk areas are encountered. This will be followed by revision of the Construction Traffic Management Plan and implementation of more appropriate procedures if the original management practices are not proven to be effective.

In addition, the following mitigation measures will be implemented during construction:

- Road maintenance will be undertaken to manage any physical damage to roads as a result of the Project activities.

- The SPV will undertake a safety awareness campaign to inform key stakeholders (such as school children and their families as well as local community members) about potential traffic impacts and traffic safety. This will be done through leaflets, public announcements and seminars.

F5.2 OPERATION MITIGATION MEASURES

It is important that the public transportation network system be in place in time for the operation of the IHC. This may reduce the reliance on private cars.

Specific to the operation phase, a Health Campus Internal Traffic Management Plan will be developed in detail and implemented that will take into account vehicular traffic, emergency conditions, pedestrian traffic entering, exiting and internal traffic.

Ongoing stakeholder engagement will be undertaken to assess how project-related traffic is affecting traffic more broadly within Gaziantep. This will be done through forums / public meetings and through dialogue with Municipalities and Muhtars. The frequency of such meetings will be determined closer to the time of operation. The results of these studies will

feed into the operation Traffic Management Plan and adjustments made as necessary. This Plan and any changes will be disclosed as part of stakeholder engagement activities with local communities during operation.

F5.2.1 Residual Impacts

The proposed new road developments in and around Akkent will ensure that:

- the increase in traffic during construction and operation will remain within the design capacity for the existing road network;
- the road network around the Project site will be further developed; and
- there will be public transportation alternatives to reach the IHC site.

In addition, the design of the health campus has been optimised to minimise congestion, queuing and idling vehicles. However even with these developments and the proposed mitigation measures in place, it is expected that the impacts will only be lowered to **moderate** significance, particularly for the operation phase.

F5.2.2 Cumulative Impacts

In addition to the construction traffic to be generated by the Project, it is expected that increased construction activities in the region will result in additional traffic generation. The details of this additional traffic are currently unknown. Based on face-to-face meeting conducted with the mayor of Şahinbey Municipality, there is no clear plan on when this area will be developed. Thus, it is assumed that the road network will continue to remain within its design carrying capacity with good capacity to absorb additional traffic increases.

Due to the fact that the area around the Project site is under development, it is likely that there will be residential/commercial developments in the coming years. However, the timing of these developments is not clear at this stage and it is not possible to undertake a cumulative impact assessment. Once these developments are completed, they will also generate traffic in addition to the health campus traffic.