4.3.5 Impact of Vehicular Traffic

- *Vehicular Movement in Parking Facilities*

A car park in-front of the terminal building has been developed at airport for the convenience of passengers and visitors to the airport. The vehicles at the parking lot include private cars, taxis and cabs. An entry and an exit of the parking facility with any idling and vehicle movement together, count as one operation. The input for average distance traveled in lot is an estimate for the average distance a vehicle travels between entry and exit.

Baseline study on traffic volume outside area and the observed speed has carried out during the study period. The anticipated additional traffic volume has been assessed assuming the movement of larger aircrafts like A-320.

With the implementation of the proposed project, the traffic is likely to increase on the existing road network near the existing airport and its surroundings. The impact of the traffic is assessed on the basis of:

1. Incremental traffic due to the proposed project;
2. Impact on air quality;
3. Adequacy of the existing internal road network; and
4. Adequacy of parking facilities.

The traffic study was conducted to know the existing traffic volume and the data is presented in Chapter-3, Section-3.9. The proposed estimated traffic is superimposed on the existing traffic to assess the adequacy of the road. Further, air pollution dispersion modeling was also done considering the existing as well as the traffic due to project using the line source model i.e. AERMOD model.

4.3.5.1 Traffic due to the Proposed Project

The existing car parking zone at airport is located in an area of 2.14 acres. At present, the peak hour capacity of car park is approximately 170 lots and the rest of the area is available for overall 328 cars, 100 taxis and 10 buses. The traffic zone details are provided in **Table-4.7**.

TABLE-4.7
TRAFFIC DENSITY – PROJECTION

Mode of Transport	No. of flights /day	No of Vehicles/day	Total PCU
Cars/Taxis/Cabs/LCV	14 LTO	=360x14 =5040	5040 PCU/day
Two/Three Wheelers		50	25 PCU/day
Total			**5065 PCU/day** **211 PCU/hr**

(PCU Factors: Light Duty Vehicles=1.0, Buses=3.0, 2/3 Wheelers=0.5)

There will be incremental traffic due to extension of runway at the existing airport. The extension of runway will allow bigger aircrafts to come in and the airport capacity will thus increase. The existing road connectivity of the airport is a four lane road. It will be adequate to carry in traffic load to airport.

It has been concluded that the existing landside road infrastructure is adequate to cater to current and future demand till 2020 taking account of all the activities envisaged within airport complex.

4.3.5.2 Impact of Traffic on Air Quality

During operation phase of the proposed project considerable number of vehicles will ply on roads and these will cause air and noise pollution along the roads. Proper maintenance of vehicles while meeting the permissible emission levels will limit the air pollution. Also ensuring functioning of silencers will ensure low noise levels from the vehicles.

4.3.5.3 Details of Mathematical Modeling

For prediction of maximum Ground Level Concentrations (GLC's), the air dispersion modeling software (AERMOD version 7.1.0) was used. AERMOD is steady state advanced Gaussian plume model that simulates air quality and deposition fields upto 50 km radius. AERMOD is approved by USEPA and is widely used software. It is an advanced version of Industrial Source Complex (ISCST3) model, utilizes similar input and output structure to ISCST3 sharing many of the same features, as well as offering additional features. The model is applicable to rural and urban areas, flat and complex terrain, surface and elevated releases and multiple sources including point, area, flare, line and volume sources. Dispersion modeling using AERMOD requires hourly meteorological data. Site specific data is used for executing modeling studies. The site specific meteorological data is processed using AERMET processor.

- Model Input Data

The predictions of traffic volume incremental concentrations of CO and NOX due to additional traffic assumed are estimated based on site specific meteorological conditions and line source. The emission rates as inputs to the line source model are calculated based on "Bharat State-III & Stage-IV Standards". The inputs used for modeling area given in **Table-4.8**.

TABLE-4.8
PARAMETERS CONSIDERED FOR MODELLING

Sr. No.	Parameter	Description
1	No of vehicles – PCU per hour	211 vehicles / hour
2	Emission factors	
	CO (g/km/vehicle)	6.0
	NOx + HC (g/km/vehicle)	9.3
	PM (g/km/vehicle)	1.24
3	Emission rate	
	CO (g/s)	2.7
	NOx + HC (g/s)	3.8
	PM	0.5

- Model Predictions

The predicted CO and NOx concentrations from vehicular traffic are presented in **Table-4.9**.

TABLE-4.9
PREDICTED INCREMENTAL CONCENTRATIONS DUE TO TRAFFIC

Sr. No.	Parameter	Concentration ($\mu g/m^3$)
1	Carbon Monoxide (CO)	31.3
2	Oxides of Nitrogen (NO_2)	45.8
3	Particulate Matter (PM_{10})	6.4

The observation from predictions reveal that the maximum NOx and CO concentration of 45.8 $\mu g/m^3$ and 31.3 $\mu g/m^3$ likely to occur at 10 m from the centre of the road. The CO and NOx concentrations are likely to be well within norms compared with NAAQS for CO (4000 $\mu g/m^3$) and WHO standard of 400 $\mu g/m^3$ for hourly average for NOx. Hence, it is assumed that the impact on the present ambient air quality due to the additional traffic from the proposed runway extension project will be within the permissible limits and will be restricted to the immediate vicinity of the roads.

4.3.5.4 Adequacy of Road network

The additional traffic contribution due to road network, will thus is the 'to and fro' movement of 5090 vehicles per day, which is equivalent to 5065 PCU/day. wherein the maximum carrying capacity of 4 land highway with earthern shoulders is of 35,000 PCU/day. The existing road to the airport from Tirupati is a 4-lane highway. The existing traffic as per the studies is about 3533 vehicles/day. The estimated peak traffic in terms of PCUs, when compared to the stipulated standards by IRC for traffic capacity of the roads and it can be observed that the existing road network is adequate. IRC recommendations are provided in **Table-4.10**.

TABLE-4.10
RECOMMENDATIONS ON TRAFFIC CAPACITY – IRC

Sr. No.	Category of Road	Maximum Carrying Capacity (PCU/day)
1	Two lane roads (7 m) with earthern shoulders	15,000
2	4- land highway with earthern shoulders	35,000

4.3.5.5 Air Quality Management

Major pollutants envisaged from the proposed project will be from aircraft exhaust, ground service equipment, vehicular traffic (airside and landside) and from DG sets. The following methods of abatement shall be employed for the air pollution control at the source level.

- Aircrafts shall be operated in accordance with ICAO/USEPA standards to ensure aircraft emissions are within specified standards;
- Allowing aircrafts with certified engines only to land and take-off, as far as possible;
- Shut down engines during idling and taxing;
- Single engine taxing and reduced taxing would be effective in reducing emissions of HC and CO from aircrafts;
- Converting ground service equipment to use alternative fuels;
- The Double Annular Combustor (DAC) burns the fuel at lower temperature in two stages to radically reduce NOx levels;
- Height of the stack for DG sets shall be kept as per CPCB guidelines;
- Providing adequate buffer zones where pollution concentrations are highest to reduce the impact of emissions;

- Appropriate design of access roads to avoid traffic jams to reduce air pollution;
- Providing suitable green belt/green cover to reduce the impact of air pollution; and
- Vehicles moving within the airport shall be maintained and emission checks shall be carried out on regular interval.

In addition to the above, any additional control measures suggested by SPCB/CPCB/MoEF&CC shall be implemented.