HINDUSTAN PETROLEUM CORPORATION

HPCL Journey Risk Management Division

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COMPREHENSIVE JOURNEY RISK MANAGEMENT ANALYSIS REPORT

ROUTE ANALYSIS DETAILS

Supply Location: Raipur Depot [1527]

Destination: MSHSD SIDDHESHWAR NATH FUELS [41015471]

Total Distance: 195.47 km

Estimated Duration: 4 hours 53 mins

Analysis Date: August 04, 2025

Report Generated: 05:41 PM

EXECUTIVE SUMMARY

ROUTE OVERVIEW

PARAMETER	DETAILS
Origin	Raipur Depot
Destination	MSHSD SIDDHESHWAR NATH FUELS
Total Distance	195.47 km
Estimated Duration	4 hours 53 mins
Major Highways	NH53, NH153
Terrain	Mixed

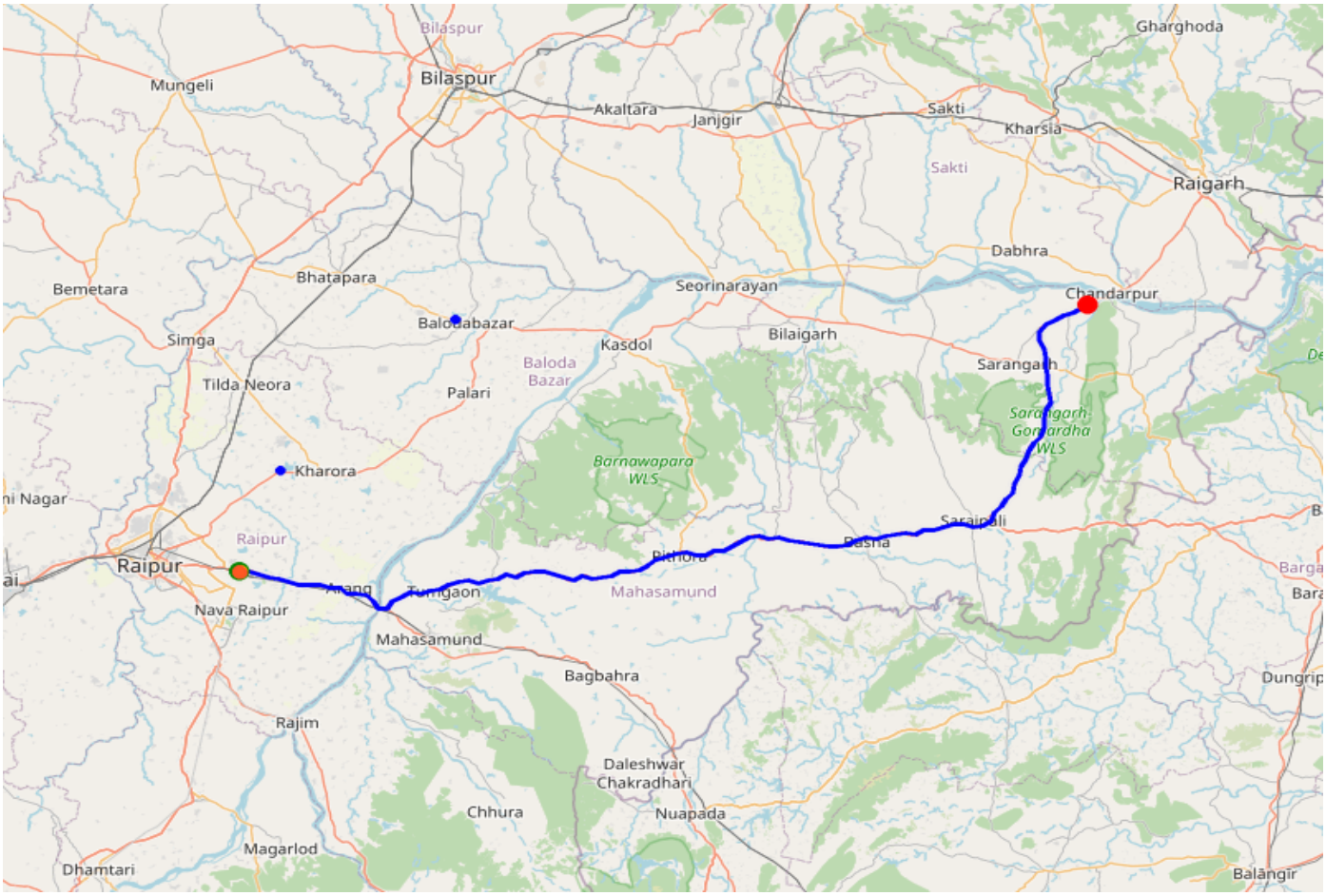
TOTAL WEIGHTED ROUTE SCORE – 3.0 [MEDIUM RISK]

RISK FACTOR RATING OVERVIEW

RISK CRITERION	RISK SCORE	RISK CATEGORY
Road Conditions	1.0	Low Risk
Accident-Prone Areas	3.4	Mild Risk
Sharp Turns	4.3	High Risk
Blind Spots	5.0	High Risk
Traffic Condition (Density)	0.5	Low Risk
Seasonal Weather Conditions	1.0	Low Risk
Emergency Handling Services	2.8	Mild Risk
Network Dead/Low Zones	5.0	High Risk
Roadside Amenities	1.0	Low Risk
Security & Social Issues	1.0	Low Risk

APPROVED ROUTE MAP

Comprehensive route visualization showing start/end points, critical turns, emergency services, highway junctions, and potential hazards.



MAP LEGEND

A	Route Start Point	**B**	Route End Point
T#	Critical Sharp Turns	**H**	Hospitals
P	Police Stations	**F**	Fire Stations
G	Gas Stations	**S**	Schools/Education
*****	Highway Junctions		

KEY SAFETY MEASURES & REGULATORY COMPLIANCE

ASPECT	DETAILS/ RECOMMENDATION
Speed Limits	NH: 60 km/h; SH: 55 km/h; MDR: 55 km/h; Rural: 25–30 km/h; Accident-prone zone: 30
Night Driving	Prohibited:2300hrs – 0500hrs
Rest Breaks	Mandatory 15-30 min every 3 hours
Vehicle Compliance	Check brakes, tires, lights, and emergency equipment
Permits & Documents	Carry valid transport permits, Hazardous vehicle license,MSDS sheets, TREM CARD
VTS	VTS & EMERGENCY LOCKING DEVICE shall be functional

Ensure all applicable local, state, and national transport regulations are met prior to journey commencement, including permits, documentation, and vehicle checks.

HIGH-RISK ZONES & KEY RISK POINTS

Type	Supply (KM)	Customer (KM)	Coordinates	Risk Level	Speed Limit	Driver Action
Sharp Turn (Right)	0.0	195.5	21.225530, 81.783160 [view]	Very High	10-15 km/h	Stop completely, check visibility, use horn, proceed at 10-15 km/h with extreme caution
Severe Blind Spot	0.1	195.4	21.225430, 81.783710 [view]	Very High	15-20 km/h	Use horn before entering, reduce speed to 20-25 km/h, stay alert for oncoming traffic
Hairpin Turn (Left)	0.1	195.4	21.224990, 81.783670 [view]	CRITICAL	10-15 km/h	Stop completely, check visibility, use horn, proceed at 10-15 km/h with extreme caution
Severe Blind Spot	0.2	195.3	21.225250, 81.784530 [view]	Very High	15-20 km/h	Use horn before entering, reduce speed to 20-25 km/h, stay alert for oncoming traffic
Severe Blind Spot	0.4	195.1	21.226120, 81.783330 [view]	Very High	15-20 km/h	Use horn before entering, reduce speed to 20-25 km/h, stay alert for oncoming traffic
Sharp Turn (Right)	0.4	195.0	21.226510, 81.783410 [view]	Very High	10-15 km/h	Stop completely, check visibility, use horn, proceed at 10-15 km/h with extreme caution
Severe Blind Spot	0.6	194.9	21.226520, 81.784580 [view]	Very High	15-20 km/h	Use horn before entering, reduce speed to 20-25 km/h, stay alert for oncoming traffic
Severe Blind Spot	0.6	194.9	21.226590, 81.784220 [view]	Very High	15-20 km/h	Use horn before entering, reduce speed to 20-25 km/h, stay alert for oncoming traffic
Sharp Turn (Right)	0.6	194.8	21.226770, 81.784290 [view]	Very High	10-15 km/h	Stop completely, check visibility, use horn, proceed at 10-15 km/h with extreme caution
Sharp Turn (Left)	0.8	194.7	21.226450, 81.785520 [view]	Very High	10-15 km/h	Stop completely, check visibility, use horn, proceed at 10-15 km/h with extreme caution
Network Dead Zone	27.8	167.7	21.203070, 81.905310 [view]	CRITICAL	Normal	Inform control room before entering, use alternative communication
Network Dead Zone	33.0	162.5	21.185970, 81.991620 [view]	CRITICAL	Normal	Inform control room before entering, use alternative communication
Network Dead Zone	40.1	155.3	21.187260, 82.082410 [view]	CRITICAL	Normal	Inform control room before entering, use alternative communication
Network Dead Zone	43.2	152.3	21.220870, 82.233100 [view]	CRITICAL	Normal	Inform control room before entering, use alternative communication
Network Dead Zone	47.4	148.1	21.220150, 82.359990 [view]	CRITICAL	Normal	Inform control room before entering, use alternative communication

HIGH-RISK ZONES & KEY RISK POINTS

Type	Supply (KM)	Customer (KM)	Coordinates	Risk Level	Speed Limit	Driver Action
Network Dead Zone	58.2	137.2	21.252750, 82.491710 [view]	CRITICAL	Normal	Inform control room before entering, use alternative communication
Network Dead Zone	66.2	129.3	21.263330, 82.590620 [view]	CRITICAL	Normal	Inform control room before entering, use alternative communication
Network Dead Zone	70.0	125.4	21.284400, 82.690250 [view]	CRITICAL	Normal	Inform control room before entering, use alternative communication
Network Dead Zone	82.4	113.1	21.284200, 82.815290 [view]	CRITICAL	Normal	Inform control room before entering, use alternative communication
Network Dead Zone	90.8	104.6	21.340630, 83.051420 [view]	CRITICAL	Normal	Inform control room before entering, use alternative communication
Network Dead Zone	103.9	91.6	21.443520, 83.099020 [view]	CRITICAL	Normal	Inform control room before entering, use alternative communication
Network Dead Zone	109.2	86.3	21.514000, 83.130040 [view]	CRITICAL	Normal	Inform control room before entering, use alternative communication
Network Dead Zone	113.9	81.6	21.592720, 83.125780 [view]	CRITICAL	Normal	Inform control room before entering, use alternative communication
Network Dead Zone	120.6	74.9	21.681680, 83.189650 [view]	CRITICAL	Normal	Inform control room before entering, use alternative communication
Sharp Turn (Left)	133.3	62.1	21.300210, 82.944020 [view]	Very High	10-15 km/h	Stop completely, check visibility, use horn, proceed at 10-15 km/h with extreme caution
Moderate Turn (Left)	143.3	52.1	21.310590, 83.035570 [view]	High	20-25 km/h	Reduce speed to 20 km/h before turn, use horn, check mirrors, stay in center of lane
Severe Blind Spot	144.7	50.8	21.317550, 83.026170 [view]	Very High	15-20 km/h	Use horn before entering, reduce speed to 20-25 km/h, stay alert for oncoming traffic
Sharp Turn (Right)	178.3	17.1	21.580520, 83.123630 [view]	Very High	10-15 km/h	Stop completely, check visibility, use horn, proceed at 10-15 km/h with extreme caution
Sharp Turn (Left)	178.5	17.0	21.580210, 83.124950 [view]	Very High	10-15 km/h	Stop completely, check visibility, use horn, proceed at 10-15 km/h with extreme caution
Moderate Turn (Right)	180.7	14.8	21.599720, 83.125070 [view]	High	20-25 km/h	Reduce speed to 20 km/h before turn, use horn, check mirrors, stay in center of lane

HIGH-RISK ZONES & KEY RISK POINTS

Type	Supply (KM)	Customer (KM)	Coordinates	Risk Level	Speed Limit	Driver Action
Severe Blind Spot	181.4	14.1	21.605930, 83.124160 **[view]**	Very High	15-20 km/h	Use horn before entering, reduce speed to 20-25 km/h, stay alert for oncoming traffic
Severe Blind Spot	181.4	14.1	21.605960, 83.124260 **[view]**	Very High	15-20 km/h	Use horn before entering, reduce speed to 20-25 km/h, stay alert for oncoming traffic
Severe Blind Spot	186.4	9.1	21.648910, 83.117270 **[view]**	Very High	15-20 km/h	Use horn before entering, reduce speed to 20-25 km/h, stay alert for oncoming traffic

All high-risk points are sorted by distance from supply location. Please exercise extreme caution at these locations.

SEASONAL ROAD CONDITIONS & TRAFFIC PATTERNS

Season / Condition	Critical Stretches / Coordinates / Roads	Link	Typical Challenges	Driver Caution
Summer - Partly Cloudy	21.2134, 82.2124 (Highway)	view	High temperature (32.9°C), dust, glare	Carry water, use sun protection, check tire pressure
Monsoon - Partly Cloudy	21.2134, 82.2124 (Highway)	view	Heavy moisture (90.4%), waterlogging risk, poor visibility	Use wipers, reduce speed, avoid flooded areas
Winter - Partly Cloudy	21.2134, 82.2124 (Highway)	view	Cool weather, possible mist	Check visibility, use headlights
Summer - Partly Cloudy	21.2255, 81.7832 (highway)	view	High temperature (33.1°C), dust, glare	Carry water, use sun protection, check tire pressure
Monsoon - Partly Cloudy	21.2255, 81.7832 (highway)	view	Heavy moisture (90.6%), waterlogging risk, poor visibility	Use wipers, reduce speed, avoid flooded areas
Winter - Partly Cloudy	21.2255, 81.7832 (highway)	view	Cool weather, possible mist	Check visibility, use headlights
Summer - Partly Cloudy	21.2899, 82.6379 (Highway)	view	High temperature (31.8°C), dust, glare	Carry water, use sun protection, check tire pressure
Monsoon - Partly Cloudy	21.2899, 82.6379 (Highway)	view	Heavy moisture (90.1%), waterlogging risk, poor visibility	Use wipers, reduce speed, avoid flooded areas
Winter - Partly Cloudy	21.2899, 82.6379 (Highway)	view	Cool weather, possible mist	Check visibility, use headlights
Summer - Partly Cloudy	21.3667, 83.0723 (Highway)	view	High temperature (31.6°C), dust, glare	Carry water, use sun protection, check tire pressure
Monsoon - Partly Cloudy	21.3667, 83.0723 (Highway)	view	Heavy moisture (90.1%), waterlogging risk, poor visibility	Use wipers, reduce speed, avoid flooded areas
Winter - Partly Cloudy	21.3667, 83.0723 (Highway)	view	Cool weather, possible mist	Check visibility, use headlights
Summer - Partly Cloudy	21.6867, 83.1939 (Highway)	view	High temperature (32.9°C), dust, glare	Carry water, use sun protection, check tire pressure
Monsoon - Partly Cloudy	21.6867, 83.1939 (Highway)	view	Heavy moisture (85.9%), waterlogging risk, poor visibility	Use wipers, reduce speed, avoid flooded areas
Winter - Partly Cloudy	21.6867, 83.1939 (Highway)	view	Cool weather, possible mist	Check visibility, use headlights

WEATHER-RELATED ACCIDENT-PRONE AREAS & CORRECTIVE MEASURES

Area	Weather Risk	Risk Type	Recommended Solution
NH53, NH153	Summer Heat	Tire Blowouts	Shade shelters, road resurfacing
Route Segments	Monsoon Rain	Hydroplaning	Better drainage, grooved pavement
Oil Terminal Junctions	Winter Fog	Poor Visibility	Fog lights, reflective markers
Urban Sections	Dust Storms	Visibility Loss	Wind barriers, warning systems

COMPREHENSIVE POINTS OF INTEREST ANALYSIS

Perameters	Value
Total POIs Identified	60
Emergency Services	44
Essential Services	0
Other Services	16
Coverage Score	0.00

EMERGENCY PREPAREDNESS & RESPONSE

MEDICAL FACILITIES - Emergency Healthcare Services- CRITICAL

id	Facility Name	Address	From Supply (km)	From Customer (km)	Coordinates	Link	Phone
1	Evangelical Mission Hospital	Tilda, Po - Neora	1.9	193.6	21.554016, 81.790334	View	Not available
2	Government Hospital, Tilda	Railway Station Road	1.9	193.5	21.549874, 81.796959	View	Not available
3	Jyoti Hospital and Prasuti Griha	Setpal Nagar, Tilda Neora Post	2.7	192.8	21.556396, 81.809076	View	Not available
4	primary government hospital Bangoli	Bangoli, Raipur	2.8	192.7	21.400548, 81.850645	View	Not available
5	Government Hospital Bitkuli	Bitkuli	2.8	192.7	21.616794, 81.936411	View	Not available
6	Government Hospital, Hirmi	Hirmi	2.9	192.6	21.544440, 81.938685	View	Not available
7	Sri Sathya Sai Sanjeevani Hospital	Not Available	4.3	191.2	21.210939, 81.811497	View	Not available
8	Raipur Institute Of Medical Sciences Hospital	Bhansoj Road, N.H-6,M.M.Funcit	6.5	189.0	21.241988, 81.836805	View	Not available
9	Government Hospital Farfoud	Farhada Road, High School	17.5	178.0	21.274376, 81.950679	View	Not available
10	Government hospital arang	Ward No 07, Near Police Station	21.2	174.3	21.194012, 81.970391	View	Not available
11	Dr Vikas chandrakar	Bhawanipatna - Raipur Hwy, Kharora	29.0	166.5	21.118367, 82.075597	View	Not available
12	RLC Multispeciality Hospital	Bhawanipatna - Raipur Hwy, Mahasamund	29.1	166.4	21.115668, 82.086619	View	Not available
13	Old District Hospital Mahasamund	Mahasamund	36.0	159.5	21.113837, 82.092952	View	Not available

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MEDICAL FACILITIES - Emergency Healthcare Services- CRITICAL

14	Tiwari Hospital	Subash Nagar	36.0	159.5	21.114822, 82.092009	View	Not available
15	shri akal purakh hospital	D.R. gurudatta, opposite railway station	36.1	159.4	21.112417, 82.104085	View	Not available
16	Government Hospital Tumgaon	Main Road Tumgaon	40.8	154.6	21.199807, 82.133190	View	Not available
17	Balodabazar	Not Available	51.8	143.7	21.661169, 82.141161	View	Not available
18	DH Baloda Bazar	District hospital baloda bazar, Main road baloda bazar, Dashara maidan baloda bazar	51.8	143.7	21.657443, 82.155968	View	Not available
19	District Hospital Baloda	vill- baloda	51.8	143.7	21.663316, 82.149301	View	Not available
20	Government Hospital, Bitkuli	Bitkuli	57.4	138.0	21.655007, 82.232167	View	Not available
21	Govt hospital dokarpali	dokarpali	71.4	124.1	21.115285, 82.441058	View	Not available
22	Government Hospital Lawan	Baloda Bazaar	80.7	114.8	21.641245, 82.332851	View	Not available
23	Government Hospital, Sarkhor	Sarkhor	84.9	110.5	21.693170, 82.355441	View	Not available
24	KEM	Not Available	85.0	110.4	21.393821, 82.484063	View	Not available
25	Sewabhawan Hospital	Mahasamund	113.8	81.7	21.335883, 82.769497	View	Not available
26	Government Hospital Basna	Basna	119.8	75.7	21.278119, 82.823850	View	Not available
27	Government Hospital Bade Sajapali	SECTOR BADESAJAPALI	126.9	68.5	21.527035, 82.864096	View	Not available
28	Government Hospital, Saraipa	bhawarpur rod	137.4	58.1	21.321784, 82.976568	View	Not available
29	Government Hospital Sarsiwa	Bus Stand Sarsiwa,Sarsiwa	184.8	10.6	21.628990, 82.932770	View	Not available
30	Government Hospital, Bhatgaon	Bhatgaon	185.3	10.2	21.654266, 82.799818	View	Not available
31	Government hospital balpur	Kosir Marg, Bhathagav Kosir	186.2	9.3	21.674755, 82.967029	View	Not available

EDUCATIONAL INSTITUTIONS - Speed Limit Zones (40 km/h) – AWARENESS

id	Facility Name	Address	From Supply (km)	From Customer (km)	Coordinates	Link	Phone
1	matadevalay school	Not Available	2.8	192.7	21.730014, 81.960092	View	Not available
5	Higher secondary School patewa	, patewa	56.3	139.1	21.221706, 82.269147	View	Not available

NOTES - GENERAL EMERGENCY GUIDELINES FOR PETROLEUM TANKER

ASPECT	GUIDELINES / ACTIONS
Vehicle Safety	Park the tanker safely on the roadside with hazard lights and emergency triangles deployed. Avoid sudden braking or jerks, especially if the tanker is partially filled.
Communication	Immediately contact the Supply Location control room and, Transport supervisor. If in a dead zone, use alternate communications. Maintain communication with authorities if directed.
Emergency Contacts	Call local police, nearest hospital, or fire station, Supply Location. Keep a printed list of these numbers in the vehicle.
Basic First-Aid	Use the onboard first-aid kit for minor injuries. In case of severe injuries, prioritize immediate attention and inform the control room.
Spill / Hazard Response	Follow MSDS and company-specific SOP for spills. Do not attempt to clean up fuel spills without proper equipment. Use absorbent materials available. Use non-sparking tools.
Fire / Explosion Risk	If a fire starts, immediately shut off the engine and evacuate the area. Use the onboard fire extinguisher only if safe to do so and trained to handle it.
Evacuation Zone	Establish a safety perimeter (minimum 50 meters) around the tanker. Do not allow smoking or the use of mobile phones, non-FLP torches, sparking tools near the spill or fire area.
Convoy / Escort Movement	In areas requiring convoy travel (e.g., night operations under police escort), maintain close coordination and avoid separating from the group.
Incident Documentation	Record incident details: time, GPS coordinates, nature of spill/accident, vehicle condition, environmental impact.

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ASPECT	GUIDELINES / ACTIONS
Personal Safety & Well-being	Wear appropriate PPE (helmet, gloves, reflective jacket). Remain calm, prioritize personal safety, and wait for emergency responders if in doubt about next steps. Use coverall during filling and unloading operations.
Regulatory Compliance	Follow all guidelines under Petroleum Rules 2002, CMVR, and company SOP for hazardous goods transportation.

Note: These guidelines are mandatory for all petroleum tanker operations. Compliance ensures safety and environmental protection

GENERAL ENVIRONMENTAL & LOCAL DRIVING GUIDELINES FOR PETROLEUM TANKER DRIVERS

Aspect	Guidelines / Actions
Eco-sensitive Areas	Drive slowly, avoid honking unnecessarily, and do not stop for breaks or cleaning in these areas.
Waterbody Crossings	Inspect for leaks before entering bridges, no refueling or repairs on or near bridges.
School & Market Areas	Maintain speed limits (25-30 km/h), stay alert for children and pedestrians, avoid peak school/market hours.
Festivals & Local Events	Expect road diversions or closures, confirm route with local authorities or control room.
Littering & Pollution Prevention	Never discard trash or spill fuel; carry spill kits and clean-up materials as per SOP.
Noise & Cultural Sensitivity	Avoid honking in populated areas and during religious or cultural gatherings.
Local Road Regulations	Follow local traffic signage and any state-specific restrictions for hazardous cargo.
Coordination with Locals	Be courteous to local communities; stop only at designated points for rest, food, or refueling.

Note: These guidelines are mandatory for all petroleum tanker operations. Compliance ensures safety and environmental protection.

DEFENSIVE DRIVING & DRIVER WELL-BEING

Checklist Item	Detailed Guidelines / Actions
Maintain safe distance, use indicators	Keep a minimum 3-second following distance from the vehicle ahead, adjust for heavy loads; always signal turns or lane changes well in advance.
Stay hydrated: carry water bottles	Carry at least 2 liters of drinking water. Avoid dehydration, especially in summer. Drink at rest stops every 1-2 hours.
Avoid heavy/oily meals before journey	Eat light, balanced meals to avoid drowsiness and discomfort. Avoid spicy, fried, or heavy foods before and during the trip.
Get at least 8 hours of sleep before starting	A good night's sleep is essential to reduce fatigue and maintain focus. Never start a trip when tired or drowsy.
Wear weather-appropriate protective gear	Use sun protection (caps, sunglasses) in summer; layered clothing in winter; always wear safety shoes and reflective vests.
Control speed based on road conditions	Adjust speed for weather, road curves, and heavy vehicle braking distances. Never exceed posted speed limits.
Plan rest breaks every 3 hours	Stop for at least 30 minutes to stretch, refresh, and check vehicle condition. Avoid continuous driving for more than 3 hours.
Defensive driving mindset	Stay calm, anticipate road users' actions, avoid aggression. Use mirrors frequently and watch for potential hazards ahead.
Emergency readiness	Keep fire extinguisher, first-aid kit, and communication device within easy reach. Be aware of nearest emergency services along the route.

Note: These guidelines are mandatory for all petroleum tanker operations. Compliance ensures safety and environmental protection.

COMPREHENSIVE ROUTE OVERVIEW & STATISTICS

BLIND SPOTS ANALYSIS WITH DUAL VISUAL EVIDENCE High Risk (Risk Score: 5.0)

Parameter	Value
Total Blind Spot Locations Analyzed	34
Crest Type Spots	0
Obstruction Type Spots	0
Curve Type Spots	21
Intersection Type Spots	0
Visibility < 500m	34
Visibility 500m–1000m	0
Visibility > 1000m	0
Spots with Mirror Installed	0
Spots Missing Warning Signs	34
Analysis Confidence	High

BLIND SPOT CLASSIFICATION SYSTEM

Angle Range	Classification	Risk Level	Max Speed	Safety Requirement
≥ 90°	EXTREME BLIND SPOT	CRITICAL	15 km/h	Full stop, check both mirrors, inch forward slowly
80°-90°	HIGH-RISK BLIND TURN	EXTREME	20 km/h	Reduce speed sharply, use horn, check for oncoming
70°-80°	BLIND SPOT	HIGH	25 km/h	Keep left, use indicators, maintain 2m clearance
60°-70°	HIGH-ANGLE TURN	MEDIUM	30 km/h	Brake before turn, avoid overtaking
45°-60°	SHARP TURN	LOW	40 km/h	Stay in lane, observe caution signage

CRITICAL BLIND SPOTS

Location (GPS)	Link	Type	Visibility (m)	Risk Level	Action Required
21.22543, 81.78371	View	Sharp_Curve	50	Critical	Use horn, stay alert
21.22525, 81.78453	View	Sharp_Curve	50	Critical	Use horn, stay alert
21.22612, 81.78333	View	Sharp_Curve	50	Critical	Use horn, stay alert
21.22651, 81.78341	View	Sharp_Curve	50	Critical	Use horn, stay alert
21.22652, 81.78458	View	Sharp_Curve	50	Critical	Use horn, stay alert
21.22659, 81.78422	View	Sharp_Curve	50	Critical	Use horn, stay alert
21.22677, 81.78429	View	Sharp_Curve	50	Critical	Use horn, stay alert
21.31755, 83.02617	View	Sharp_Curve	50	Critical	Use horn, stay alert
21.58052, 83.12363	View	Sharp_Curve	50	Critical	Use horn, stay alert
21.58021, 83.12495	View	Sharp_Curve	50	Critical	Use horn, stay alert
21.60593, 83.12416	View	Sharp_Curve	50	Critical	Use horn, stay alert
21.60596, 83.12426	View	Sharp_Curve	50	Critical	Use horn, stay alert
21.64891, 83.11727	View	Sharp_Curve	50	Critical	Use horn, stay alert

CRITICAL TURN #1: SHARP_CURVE - SEVERE BLIND SPOT - HIGH RISK

Parameter	Value
GPS Coordinates	21.225430, 81.783710 (view)
Spot Type	Sharp_Curve
Risk Classification	SEVERE BLIND SPOT - SHARP_CURVE
Risk Level	4.0/5 - High Risk
Distance from Supply Location	0.1 km
Visibility Distance	50 meters
Visibility Category	Poor (50-100m)
Obstruction Height	Not specified
Road Geometry - Gradient	0.0°
Road Geometry - Curvature	0.0°
Road Width	7.0 m
Vegetation Present	No
Warning Signs Present	No
Mirror Installed	No
Driver Action Required	Sound horn continuously, reduce to 10-15 km/h

VISUAL EVIDENCE FOR BLIND SPOT #1:

Visual evidence not available -Satellite View Not Available

CRITICAL SAFETY RECOMMENDATIONS FOR BLIND SPOT

- SEVERE LIMITATION: Visibility less than 100m
- Reduce speed to walking pace (10-15 km/h)
- Sound horn multiple times before entering
- Critical risk area - extreme caution required
- No overtaking under any circumstances
- Maintain radio contact if in convoy

CRITICAL TURN #2: SHARP_CURVE - SEVERE BLIND SPOT - HIGH RISK

Parameter	Value
GPS Coordinates	21.225250, 81.784530 **(view)**
Spot Type	Sharp_Curve
Risk Classification	SEVERE BLIND SPOT - SHARP_CURVE
Risk Level	4.0/5 - High Risk
Distance from Supply Location	0.2 km
Visibility Distance	50 meters
Visibility Category	Poor (50-100m)
Obstruction Height	Not specified
Road Geometry - Gradient	0.0°
Road Geometry - Curvature	0.0°
Road Width	7.0 m
Vegetation Present	No
Warning Signs Present	No
Mirror Installed	No
Driver Action Required	Sound horn continuously, reduce to 10-15 km/h

VISUAL EVIDENCE FOR BLIND SPOT #2:

Visual evidence not available -Satellite View Not Available

CRITICAL SAFETY RECOMMENDATIONS FOR BLIND SPOT

- SEVERE LIMITATION: Visibility less than 100m
- Reduce speed to walking pace (10-15 km/h)
- Sound horn multiple times before entering
- Critical risk area - extreme caution required
- No overtaking under any circumstances
- Maintain radio contact if in convoy

CRITICAL TURN #3: SHARP_CURVE - SEVERE BLIND SPOT - HIGH RISK

Parameter	Value
GPS Coordinates	21.226120, 81.783330 (view)
Spot Type	Sharp_Curve
Risk Classification	SEVERE BLIND SPOT - SHARP_CURVE
Risk Level	4.0/5 - High Risk
Distance from Supply Location	0.4 km
Visibility Distance	50 meters
Visibility Category	Poor (50-100m)
Obstruction Height	Not specified
Road Geometry - Gradient	0.0°
Road Geometry - Curvature	0.0°
Road Width	7.0 m
Vegetation Present	No
Warning Signs Present	No
Mirror Installed	No
Driver Action Required	Sound horn continuously, reduce to 10-15 km/h

VISUAL EVIDENCE FOR BLIND SPOT #3:

Visual evidence not available -Satellite View Not Available

CRITICAL SAFETY RECOMMENDATIONS FOR BLIND SPOT

- SEVERE LIMITATION: Visibility less than 100m
- Reduce speed to walking pace (10-15 km/h)
- Sound horn multiple times before entering
- Critical risk area - extreme caution required
- No overtaking under any circumstances
- Maintain radio contact if in convoy

CRITICAL TURN #4: SHARP_CURVE - SEVERE BLIND SPOT - HIGH RISK

Parameter	Value
GPS Coordinates	21.226510, 81.783410 (view)
Spot Type	Sharp_Curve
Risk Classification	SEVERE BLIND SPOT - SHARP_CURVE
Risk Level	4.0/5 - High Risk
Distance from Supply Location	0.4 km
Visibility Distance	50 meters
Visibility Category	Poor (50-100m)
Obstruction Height	Not specified
Road Geometry - Gradient	0.0°
Road Geometry - Curvature	0.0°
Road Width	7.0 m
Vegetation Present	No
Warning Signs Present	No
Mirror Installed	No
Driver Action Required	Sound horn continuously, reduce to 10-15 km/h

VISUAL EVIDENCE FOR BLIND SPOT #4:

Visual evidence not available -Satellite View Not Available

CRITICAL SAFETY RECOMMENDATIONS FOR BLIND SPOT

- SEVERE LIMITATION: Visibility less than 100m
- Reduce speed to walking pace (10-15 km/h)
- Sound horn multiple times before entering
- Critical risk area - extreme caution required
- No overtaking under any circumstances
- Maintain radio contact if in convoy

CRITICAL TURN #5: SHARP_CURVE - SEVERE BLIND SPOT - HIGH RISK

Parameter	Value
GPS Coordinates	21.226520, 81.784580 (view)
Spot Type	Sharp_Curve
Risk Classification	SEVERE BLIND SPOT - SHARP_CURVE
Risk Level	4.0/5 - High Risk
Distance from Supply Location	0.6 km
Visibility Distance	50 meters
Visibility Category	Poor (50-100m)
Obstruction Height	Not specified
Road Geometry - Gradient	0.0°
Road Geometry - Curvature	0.0°
Road Width	7.0 m
Vegetation Present	No
Warning Signs Present	No
Mirror Installed	No
Driver Action Required	Sound horn continuously, reduce to 10-15 km/h

VISUAL EVIDENCE FOR BLIND SPOT #5:

Visual evidence not available -Satellite View Not Available

CRITICAL SAFETY RECOMMENDATIONS FOR BLIND SPOT

- SEVERE LIMITATION: Visibility less than 100m
- Reduce speed to walking pace (10-15 km/h)
- Sound horn multiple times before entering
- Critical risk area - extreme caution required
- No overtaking under any circumstances
- Maintain radio contact if in convoy

CRITICAL TURN #6: SHARP_CURVE - SEVERE BLIND SPOT - HIGH RISK

Parameter	Value
GPS Coordinates	21.226590, 81.784220 (view)
Spot Type	Sharp_Curve
Risk Classification	SEVERE BLIND SPOT - SHARP_CURVE
Risk Level	4.0/5 - High Risk
Distance from Supply Location	0.6 km
Visibility Distance	50 meters
Visibility Category	Poor (50-100m)
Obstruction Height	Not specified
Road Geometry - Gradient	0.0°
Road Geometry - Curvature	0.0°
Road Width	7.0 m
Vegetation Present	No
Warning Signs Present	No
Mirror Installed	No
Driver Action Required	Sound horn continuously, reduce to 10-15 km/h

VISUAL EVIDENCE FOR BLIND SPOT #6:

Visual evidence not available -Satellite View Not Available

CRITICAL SAFETY RECOMMENDATIONS FOR BLIND SPOT

- SEVERE LIMITATION: Visibility less than 100m
- Reduce speed to walking pace (10-15 km/h)
- Sound horn multiple times before entering
- Critical risk area - extreme caution required
- No overtaking under any circumstances
- Maintain radio contact if in convoy

CRITICAL TURN #7: SHARP_CURVE - SEVERE BLIND SPOT - HIGH RISK

Parameter	Value
GPS Coordinates	21.226770, 81.784290 (view)
Spot Type	Sharp_Curve
Risk Classification	SEVERE BLIND SPOT - SHARP_CURVE
Risk Level	4.0/5 - High Risk
Distance from Supply Location	0.6 km
Visibility Distance	50 meters
Visibility Category	Poor (50-100m)
Obstruction Height	Not specified
Road Geometry - Gradient	0.0°
Road Geometry - Curvature	0.0°
Road Width	7.0 m
Vegetation Present	No
Warning Signs Present	No
Mirror Installed	No
Driver Action Required	Sound horn continuously, reduce to 10-15 km/h

VISUAL EVIDENCE FOR BLIND SPOT #7:

Visual evidence not available -Satellite View Not Available

CRITICAL SAFETY RECOMMENDATIONS FOR BLIND SPOT

- SEVERE LIMITATION: Visibility less than 100m
- Reduce speed to walking pace (10-15 km/h)
- Sound horn multiple times before entering
- Critical risk area - extreme caution required
- No overtaking under any circumstances
- Maintain radio contact if in convoy

CRITICAL TURN #8: SHARP_CURVE - SEVERE BLIND SPOT - HIGH RISK

Parameter	Value
GPS Coordinates	21.317550, 83.026170 (view)
Spot Type	Sharp_Curve
Risk Classification	SEVERE BLIND SPOT - SHARP_CURVE
Risk Level	4.0/5 - High Risk
Distance from Supply Location	144.7 km
Visibility Distance	50 meters
Visibility Category	Poor (50-100m)
Obstruction Height	Not specified
Road Geometry - Gradient	0.0°
Road Geometry - Curvature	0.0°
Road Width	7.0 m
Vegetation Present	No
Warning Signs Present	No
Mirror Installed	No
Driver Action Required	Sound horn continuously, reduce to 10-15 km/h

VISUAL EVIDENCE FOR BLIND SPOT #8:

Visual evidence not available -Satellite View Not Available

CRITICAL SAFETY RECOMMENDATIONS FOR BLIND SPOT

- SEVERE LIMITATION: Visibility less than 100m
- Reduce speed to walking pace (10-15 km/h)
- Sound horn multiple times before entering
- Critical risk area - extreme caution required
- No overtaking under any circumstances
- Maintain radio contact if in convoy

CRITICAL TURN #9: SHARP_CURVE - SEVERE BLIND SPOT - HIGH RISK

Parameter	Value
GPS Coordinates	21.580520, 83.123630 (view)
Spot Type	Sharp_Curve
Risk Classification	SEVERE BLIND SPOT - SHARP_CURVE
Risk Level	4.0/5 - High Risk
Distance from Supply Location	178.3 km
Visibility Distance	50 meters
Visibility Category	Poor (50-100m)
Obstruction Height	Not specified
Road Geometry - Gradient	0.0°
Road Geometry - Curvature	0.0°
Road Width	7.0 m
Vegetation Present	No
Warning Signs Present	No
Mirror Installed	No
Driver Action Required	Sound horn continuously, reduce to 10-15 km/h

VISUAL EVIDENCE FOR BLIND SPOT #9:

Visual evidence not available -Satellite View Not Available

CRITICAL SAFETY RECOMMENDATIONS FOR BLIND SPOT

- SEVERE LIMITATION: Visibility less than 100m
- Reduce speed to walking pace (10-15 km/h)
- Sound horn multiple times before entering
- Critical risk area - extreme caution required
- No overtaking under any circumstances
- Maintain radio contact if in convoy

CRITICAL TURN #10: SHARP_CURVE - SEVERE BLIND SPOT - HIGH RISK

Parameter	Value
GPS Coordinates	21.580210, 83.124950 (view)
Spot Type	Sharp_Curve
Risk Classification	SEVERE BLIND SPOT - SHARP_CURVE
Risk Level	4.0/5 - High Risk
Distance from Supply Location	178.5 km
Visibility Distance	50 meters
Visibility Category	Poor (50-100m)
Obstruction Height	Not specified
Road Geometry - Gradient	0.0°
Road Geometry - Curvature	0.0°
Road Width	7.0 m
Vegetation Present	No
Warning Signs Present	No
Mirror Installed	No
Driver Action Required	Sound horn continuously, reduce to 10-15 km/h

VISUAL EVIDENCE FOR BLIND SPOT #10:

Visual evidence not available -Satellite View Not Available

CRITICAL SAFETY RECOMMENDATIONS FOR BLIND SPOT

- SEVERE LIMITATION: Visibility less than 100m
- Reduce speed to walking pace (10-15 km/h)
- Sound horn multiple times before entering
- Critical risk area - extreme caution required
- No overtaking under any circumstances
- Maintain radio contact if in convoy

SHARP TURNS ANALYSIS WITH DUAL VISUAL EVIDENCE High Risk (Risk Score: 4.3)

Parameter	Value
Total Sharp Turns Detected	21
Extreme Danger Turns (>=90 deg)	10
High-Risk Blind Spots (80-90 deg)	3
Sharp Danger Zones (70-80 deg)	5
Moderate Risk Turns (45-70 deg)	3
Most Dangerous Turn Angle	175.2°
Average Turn Angle	91.1°
Street View Images Available	0
Satellite Images Available	0
Route Map Images Available	0
Total Visual Evidence Files	0

SHARP TURN CLASSIFICATION SYSTEM

Angle Range	Classification	Risk Level	Max Speed	Safety Requirement
≥ 120°	HAIRPIN TURN	CRITICAL	10-15 km/h	Full stop, sharp steering, extreme caution, check mirrors, inch forward slowly
100°-119.9°	EXTREME SHARP TURN	EXTREME	15-20 km/h	Slow down significantly, use mirrors, stay tight inside lane
80°-99.9°	VERY SHARP TURN	HIGH	20 km/h	Reduce speed, use mirrors, no overtaking
60°-79.9°	HIGH-ANGLE TURN	MEDIUM	25-30 km/h	Brake before turn, keep lane position
45°-60°	SHARP TURN	LOW	30-40 km/h	Stay in lane, observe caution signage
30°-44.9°	MODERATE TURN	VERY LOW	40-50 km/h	Normal caution, light braking
< 30°	GENTLE CURVE	MINIMAL	50+ km/h	Maintain lane, standard driving

CRITICAL SHARP TURNS

Location(GPS)	Link	Turn Angle	Direction	Risk Level	Severity
21.22553, 81.78316	View	101.0	right	Critical	sharp
21.22499, 81.78367	View	175.2	left	Critical	hairpin
21.22651, 81.78341	View	100.8	right	Critical	sharp
21.22677, 81.78429	View	101.5	right	Critical	sharp
21.22645, 81.78552	View	115.5	left	Critical	sharp
21.30021, 82.94402	View	115.5	left	Critical	sharp
21.58052, 83.12363	View	101.1	right	Critical	sharp
21.58021, 83.12495	View	103.6	left	Critical	sharp

CRITICAL TURN #1: 101.0° - SHARP TURN - HIGH RISK

Parameter	Value
GPS Coordinates	21.225530, 81.783160 (view)
Turn Angle	101.0° (Deviation from straight path)
Risk Classification	SHARP TURN - CRITICAL
Risk Level	8/5 - High Risk
Distance from Supply Location	0.0 km
Turn Direction	Right
Turn Radius	Not specified
Approach Speed	60 km/h
Recommended Maximum Speed	25 km/h
Safety Distance Required	Minimum 50m approach visibility
Road Surface	Good
Visibility	Moderate
Warning Signs Present	No
Guardrails Present	No
Driver Action Required	Stop, check visibility, proceed at 10-15 km/h

VISUAL EVIDENCE FOR TURN #1:

Visual evidence not available - Satellite View Not Available

CRITICAL SAFETY RECOMMENDATIONS

- EXTREME CAUTION: Consider alternative route if possible
- Mandatory convoy travel with lead vehicle communication
- Complete stop before turn to assess conditions
- Sharp turn: Reduce speed to 15-20 km/h before entering
- Stay in center of your lane throughout turn

CRITICAL TURN #2: 83.8° - MODERATE TURN - CAUTION ADVISED

Parameter	Value
GPS Coordinates	21.225430, 81.783710 (view)
Turn Angle	83.8° (Deviation from straight path)
Risk Classification	MODERATE TURN - HIGH RISK
Risk Level	7/5 - High Risk
Distance from Supply Location	0.1 km
Turn Direction	Right
Turn Radius	Not specified
Approach Speed	60 km/h
Recommended Maximum Speed	30 km/h
Safety Distance Required	Minimum 50m approach visibility
Road Surface	Good
Visibility	Moderate
Warning Signs Present	No
Guardrails Present	No
Driver Action Required	Reduce speed to 20 km/h, use horn, check mirrors

VISUAL EVIDENCE FOR TURN #2:

Visual evidence not available - Satellite View Not Available

CRITICAL SAFETY RECOMMENDATIONS

- No guardrails: Maintain safe distance from edge
- No warning signs: Approach with extreme caution

CRITICAL TURN #3: 175.2° - HAIRPIN TURN - EXTREME CAUTION

Parameter	Value
GPS Coordinates	21.224990, 81.783670 (view)
Turn Angle	175.2° (Deviation from straight path)
Risk Classification	HAIRPIN TURN - EXTREME RISK
Risk Level	9/5 - High Risk
Distance from Supply Location	0.1 km
Turn Direction	Left
Turn Radius	Not specified
Approach Speed	60 km/h
Recommended Maximum Speed	20 km/h
Safety Distance Required	Minimum 50m approach visibility
Road Surface	Good
Visibility	Moderate
Warning Signs Present	No
Guardrails Present	No
Driver Action Required	Stop, check visibility, proceed at 10-15 km/h

VISUAL EVIDENCE FOR TURN #3:

Visual evidence not available - Satellite View Not Available

CRITICAL SAFETY RECOMMENDATIONS

- EXTREME CAUTION: Consider alternative route if possible
- Mandatory convoy travel with lead vehicle communication
- Complete stop before turn to assess conditions
- Hairpin turn: Use lowest gear for engine braking
- Sound horn continuously while navigating turn

CRITICAL TURN #4: 80.8° - MODERATE TURN - CAUTION ADVISED

Parameter	Value
GPS Coordinates	21.225250, 81.784530 **(view)**
Turn Angle	80.8° (Deviation from straight path)
Risk Classification	MODERATE TURN - HIGH RISK
Risk Level	7/5 - High Risk
Distance from Supply Location	0.2 km
Turn Direction	Right
Turn Radius	Not specified
Approach Speed	60 km/h
Recommended Maximum Speed	30 km/h
Safety Distance Required	Minimum 50m approach visibility
Road Surface	Good
Visibility	Moderate
Warning Signs Present	No
Guardrails Present	No
Driver Action Required	Reduce speed to 20 km/h, use horn, check mirrors

VISUAL EVIDENCE FOR TURN #4:

Visual evidence not available - Satellite View Not Available

CRITICAL SAFETY RECOMMENDATIONS

- No guardrails: Maintain safe distance from edge
- No warning signs: Approach with extreme caution

CRITICAL TURN #5: 78.3° - MODERATE TURN - CAUTION ADVISED

Parameter	Value
GPS Coordinates	21.226120, 81.783330 (view)
Turn Angle	78.3° (Deviation from straight path)
Risk Classification	MODERATE TURN - HIGH RISK
Risk Level	7/5 - High Risk
Distance from Supply Location	0.4 km
Turn Direction	Left
Turn Radius	Not specified
Approach Speed	60 km/h
Recommended Maximum Speed	30 km/h
Safety Distance Required	Minimum 50m approach visibility
Road Surface	Good
Visibility	Moderate
Warning Signs Present	No
Guardrails Present	No
Driver Action Required	Reduce speed to 20 km/h, use horn, check mirrors

VISUAL EVIDENCE FOR TURN #5:

Visual evidence not available - Satellite View Not Available

CRITICAL SAFETY RECOMMENDATIONS

- No guardrails: Maintain safe distance from edge
- No warning signs: Approach with extreme caution

CRITICAL TURN #6: 100.8° - SHARP TURN - HIGH RISK

Parameter	Value
GPS Coordinates	21.226510, 81.783410 (view)
Turn Angle	100.8° (Deviation from straight path)
Risk Classification	SHARP TURN - CRITICAL
Risk Level	8/5 - High Risk
Distance from Supply Location	0.4 km
Turn Direction	Right
Turn Radius	Not specified
Approach Speed	60 km/h
Recommended Maximum Speed	25 km/h
Safety Distance Required	Minimum 50m approach visibility
Road Surface	Good
Visibility	Moderate
Warning Signs Present	No
Guardrails Present	No
Driver Action Required	Stop, check visibility, proceed at 10-15 km/h

VISUAL EVIDENCE FOR TURN #6:

Visual evidence not available - Satellite View Not Available

CRITICAL SAFETY RECOMMENDATIONS

- EXTREME CAUTION: Consider alternative route if possible
- Mandatory convoy travel with lead vehicle communication
- Complete stop before turn to assess conditions
- Sharp turn: Reduce speed to 15-20 km/h before entering
- Stay in center of your lane throughout turn

CRITICAL TURN #7: 80.6° - MODERATE TURN - CAUTION ADVISED

Parameter	Value
GPS Coordinates	21.226520, 81.784580 **(view)**
Turn Angle	80.6° (Deviation from straight path)
Risk Classification	MODERATE TURN - HIGH RISK
Risk Level	7/5 - High Risk
Distance from Supply Location	0.6 km
Turn Direction	Right
Turn Radius	Not specified
Approach Speed	60 km/h
Recommended Maximum Speed	30 km/h
Safety Distance Required	Minimum 50m approach visibility
Road Surface	Good
Visibility	Moderate
Warning Signs Present	No
Guardrails Present	No
Driver Action Required	Reduce speed to 20 km/h, use horn, check mirrors

VISUAL EVIDENCE FOR TURN #7:

Visual evidence not available - Satellite View Not Available

CRITICAL SAFETY RECOMMENDATIONS

- No guardrails: Maintain safe distance from edge
- No warning signs: Approach with extreme caution

CRITICAL TURN #8: 76.9° - MODERATE TURN - CAUTION ADVISED

Parameter	Value
GPS Coordinates	21.226590, 81.784220 (view)
Turn Angle	76.9° (Deviation from straight path)
Risk Classification	MODERATE TURN - HIGH RISK
Risk Level	7/5 - High Risk
Distance from Supply Location	0.6 km
Turn Direction	Left
Turn Radius	Not specified
Approach Speed	60 km/h
Recommended Maximum Speed	30 km/h
Safety Distance Required	Minimum 50m approach visibility
Road Surface	Good
Visibility	Moderate
Warning Signs Present	No
Guardrails Present	No
Driver Action Required	Reduce speed to 20 km/h, use horn, check mirrors

VISUAL EVIDENCE FOR TURN #8:

Visual evidence not available - Satellite View Not Available

CRITICAL SAFETY RECOMMENDATIONS

- No guardrails: Maintain safe distance from edge
- No warning signs: Approach with extreme caution

CRITICAL TURN #9: 101.5° - SHARP TURN - HIGH RISK

Parameter	Value
GPS Coordinates	21.226770, 81.784290 (view)
Turn Angle	101.5° (Deviation from straight path)
Risk Classification	SHARP TURN - CRITICAL
Risk Level	8/5 - High Risk
Distance from Supply Location	0.6 km
Turn Direction	Right
Turn Radius	Not specified
Approach Speed	60 km/h
Recommended Maximum Speed	25 km/h
Safety Distance Required	Minimum 50m approach visibility
Road Surface	Good
Visibility	Moderate
Warning Signs Present	No
Guardrails Present	No
Driver Action Required	Stop, check visibility, proceed at 10-15 km/h

VISUAL EVIDENCE FOR TURN #9:

Visual evidence not available - Satellite View Not Available

CRITICAL SAFETY RECOMMENDATIONS

- EXTREME CAUTION: Consider alternative route if possible
- Mandatory convoy travel with lead vehicle communication
- Complete stop before turn to assess conditions
- Sharp turn: Reduce speed to 15-20 km/h before entering
- Stay in center of your lane throughout turn

CRITICAL TURN #10: 115.5° - SHARP TURN - HIGH RISK

Parameter	Value
GPS Coordinates	21.226450, 81.785520 (view)
Turn Angle	115.5° (Deviation from straight path)
Risk Classification	SHARP TURN - CRITICAL
Risk Level	8/5 - High Risk
Distance from Supply Location	0.8 km
Turn Direction	Left
Turn Radius	Not specified
Approach Speed	60 km/h
Recommended Maximum Speed	25 km/h
Safety Distance Required	Minimum 50m approach visibility
Road Surface	Good
Visibility	Moderate
Warning Signs Present	No
Guardrails Present	No
Driver Action Required	Stop, check visibility, proceed at 10-15 km/h

VISUAL EVIDENCE FOR TURN #10:

Visual evidence not available - Satellite View Not Available

CRITICAL SAFETY RECOMMENDATIONS

- EXTREME CAUTION: Consider alternative route if possible
- Mandatory convoy travel with lead vehicle communication
- Complete stop before turn to assess conditions
- Sharp turn: Reduce speed to 15-20 km/h before entering
- Stay in center of your lane throughout turn

ACCIDENT PRONE TURNS ZONES ANALYSIS WITH DUAL VISUAL EVIDENCE (Risk score: 3.4)

Description	Value
Total Accident-Prone Locations Analyzed	16
Yearly Accident Frequency ≥ 11	16
Locations with Time-of-Day Risk Data	16
Locations with Weather-Related Risk > 5	16
Locations with Infrastructure Risk > 5	0
Locations with Traffic Volume Risk > 5	0
Analysis Confidence	High

ACCIDENT-PRONE TURNS ZONES CLASSIFICATION SYSTEM

Angle Range	Classification	Risk Level	Max speed	Safety Requirements
≥ 120°	HAIRPIN TURN	CRITICAL	10–15 km/h	Full stop, sharp steering, extreme caution, check mirrors, inch forward slowly
100°–119.9°	EXTREME SHARP TURN	EXTREME	15–20 km/h	Slow down significantly, use mirrors, stay tight inside lane
80°–99.9°	VERY SHARP TURN	HIGH	20 km/h	Reduce speed, use mirrors, no overtaking
60°–79.9°	HIGH-ANGLE TURN	MEDIUM	25–30 km/h	Brake before turn, keep lane position
45°–60°	SHARP TURN	LOW	30–40 km/h	Stay in lane, observe caution signage
30°–44.9°	MODERATE TURN	VERY LOW	40–50 km/h	Normal caution, light braking
< 30°	GENTLE CURVE	MINIMAL	50+ km/h	Maintain lane, standard driving

Moderate Accidental Prones

Location (GPS)	Link	Risk Level	Severity
21.22553, 81.78316	View	Critical	HIGH
21.22543, 81.78371	View	Critical	MEDIUM
21.22499, 81.78367	View	Critical	HIGH
21.22525, 81.78453	View	Critical	MEDIUM
21.22612, 81.78333	View	Critical	MEDIUM
21.22651, 81.78341	View	Critical	HIGH
21.22652, 81.78458	View	Critical	MEDIUM
21.22659, 81.78422	View	Critical	MEDIUM
21.22677, 81.78429	View	Critical	HIGH

Continued on next page... (Showing 9 of 16 total records)

Moderate Accidental Prones

21.22645, 81.78552	View	Critical	HIGH
21.30021, 82.94402	View	Critical	HIGH
21.31059, 83.03557	View	Critical	MEDIUM
21.58052, 83.12363	View	Critical	HIGH
21.58021, 83.12495	View	Critical	HIGH
21.59972, 83.12507	View	Critical	MEDIUM
21.60593, 83.12416	View	Critical	MEDIUM

CRITICAL SERVICE GAPS IDENTIFIED

* No critical service gaps identified - Good service coverage along route

COMPREHENSIVE EMERGENCY PREPAREDNESS CHECKLIST

* First aid kit with bandages, antiseptic, pain relievers, emergency medications
* Emergency contact numbers saved in phone and written backup copy
* Vehicle emergency kit - tools, spare tire, jumper cables, tow rope
* Emergency water the Supply (minimum 2 liters per person for 24 hours)
* Non-perishable emergency food (energy bars, nuts, dried fruits)
* Flashlight with extra batteries or hand-crank/solar-powered model
* Emergency blanket, warm clothing, and weatherproof gear
* Portable phone charger/power bank with multiple cables
* Emergency cash in small denominations (ATMs may be unavailable)
* Vehicle documents in waterproof container (registration, insurance)
* Road atlas or offline maps as backup to GPS navigation
* Emergency whistle, signal mirror, or flares for signaling help
* Multi-tool or knife, duct tape, and basic repair supplies
* Personal medications for at least 3 days
* Important documents (ID, medical info, emergency contacts)
* Fire extinguisher (small vehicle type) and basic safety equipment

EMERGENCY RESPONSE ACTION PLAN

* ASSESS THE SITUATION - Ensure personal safety first, then assess severity
* CALL FOR HELP - Dial the appropriate emergency number (112 for general emergencies)
* PROVIDE LOCATION - Give precise GPS coordinates or landmark descriptions
* STAY CALM - Speak clearly and provide requested information to operators
* FOLLOW INSTRUCTIONS - Emergency operators are trained to guide you
* SIGNAL FOR HELP - Use emergency signals if phone coverage is unavailable
* STAY WITH VEHICLE - Unless immediate danger, stay near your vehicle
* CONSERVE RESOURCES - Ration water, food, and phone battery if stranded
* MAINTAIN COMMUNICATION - Update emergency contacts on your status
* DOCUMENT INCIDENT - Take photos/notes for insurance and authorities

COMPREHENSIVE NETWORK COVERAGE ANALYSIS - 1.0 Coverage

Coverage Metric	Value
Total Analysis Points	16
Good Coverage Areas	0 points (0.0%)
Weak Signal Areas (signal < 4)	0 points (0.0%)
Dead Zones Identified	16 areas (100.0%)
Overall Coverage Status	POOR
Network Reliability	LOW

SIGNAL QUALITY DISTRIBUTION ANALYSIS

Signal Quality Level	Points Count	Route %	Status
No Signal (Dead Zone)	16	100.0%	Critical
Poor Signal (1-2 bar)	0	0.0%	Attention
Fair Signal (2-3 bar)	0	0.0%	Good
Good Signal (3-4 bar)	0	0.0%	Good
Excellent Signal (4+)	0	0.0%	Good

DEAD ZONES - NO CELLULAR SERVICE (16 locations)

id	Zone Location (GPS)	Link	Impact Level	Recommendation
1	21.225530, 81.783160	View	CRITICAL	Use satellite communication
2	21.203070, 81.905310	View	CRITICAL	Use satellite communication
3	21.185970, 81.991620	View	CRITICAL	Use satellite communication
4	21.187260, 82.082410	View	CRITICAL	Use satellite communication
5	21.220870, 82.233100	View	CRITICAL	Use satellite communication
6	21.220150, 82.359990	View	CRITICAL	Use satellite communication
7	21.252750, 82.491710	View	CRITICAL	Use satellite communication
8	21.263330, 82.590620	View	CRITICAL	Use satellite communication
9	21.284400, 82.690250	View	CRITICAL	Use satellite communication
10	21.284200, 82.815290	View	CRITICAL	Use satellite communication
11	21.300210, 82.944020	View	CRITICAL	Use satellite communication
12	21.340630, 83.051420	View	CRITICAL	Use satellite communication
13	21.443520, 83.099020	View	CRITICAL	Use satellite communication
14	21.514000, 83.130040	View	CRITICAL	Use satellite communication
15	21.592720, 83.125780	View	CRITICAL	Use satellite communication

Continued on next page... (Showing 15 of 16 total records)

DEAD ZONES - NO CELLULAR SERVICE (16 locations)

16	21.681680, 83.189650	View	CRITICAL	Use satellite communication

NETWORK COVERAGE RECOMMENDATIONS

* Route has 16 dead zones - consider satellite communication device
* Route has 0 weak signal areas - download offline maps before travel
* Inform someone of your route and expected arrival time

EMERGENCY COMMUNICATION PLAN

Download offline maps before travel (Google Maps, Maps.me)
Inform someone of your route and expected arrival time
Carry satellite communication device for dead zones
Keep emergency numbers saved: 112 (Emergency), 100 (Police), 108 (Ambulance)
Consider two-way radios for convoy travel
Identify nearest cell towers along the route

COMPREHENSIVE WEATHER CONDITIONS ANALYSIS Mild Risk (Risk Score: 1.0)

Weather Analysis Points	Summer (Apr–Jun)	Monsoon (Jul–Sep)	Autumn (Oct–Nov)	Winter (Dec–Mar)
Average Temperature	32.45°C	26.68°C	None°C	18.56°C
Temperature Range	31.56°C – 33.06°C	26.38°C – 27.41°C	None°C – None°C	17.93°C – 20.01°C
Weather Conditions were detected.	Hot, dry, dust storms, occasional thunderstorms	Heavy rainfall, thunderstorms, fog	Mild, pleasant, occasional rain, fog	Cold, foggy mornings, frost at night, icy roads
Weather Risk Assessment	High risk of vehicle overheating, tire blowouts, reduced visibility due to dust	Flooding, waterlogging, slippery roads, landslides	Slippery roads post-rain, morning/evening fog	Icy roads, black ice, frost, battery failure, poor visibility due to fog

Route: Northern Plains of India – Raipur Depot to MSHSD SIDDHESHWAR NATH FUELS

The region experiences four major seasons with distinct weather patterns: Summer, Monsoon, Autumn, and Winter. Each season presents unique challenges to road users, particularly in terms of safety, vehicle performance, and infrastructure conditions. Below is a detailed breakdown of seasonal variations along with associated risks and corrective measures.

SEASONAL WEATHER VARIATIONS ACROSS THE ROUTE

Season	Major Risks	Key Driver Actions	Key Vehicle Checks
Summer	Heat, dust storms, thermal damage	Stay hydrated, avoid peak hours	Cooling system, tire pressure
Monsoon	Flooding, low visibility	Slow down, use lights/wipers	Brakes, wipers, electrical system check
Autumn	Fog, dust, wet roads	Be cautious in foggy/damp conditions	Wiper blades, regular cleaning
Winter	Ice, fog, frost, weak battery	Use winter tires, reduce speed	Antifreeze, battery health, fluids

COMPREHENSIVE REGULATORY COMPLIANCE ANALYSIS

COMPLIANCE STATUS: NEEDS ATTENTION

VEHICLE & ROUTE COMPLIANCE DETAILS

Perameters	Value
Vehicle Type	Heavy Goods Vehicle
Vehicle Category	Heavy Goods Vehicle
AIS-140 GPS Tracking Required	YES (Mandatory)
Route Origin	Raipur Depot [1527]
Route Destination	MSHSD SIDDHESHWAR NATH FUELS [41015471]
Total Route Distance	195.47 km
Estimated Travel Duration	4 hours 53 mins
Interstate Travel	NO

MANDATORY COMPLIANCE REQUIREMENTS

Requirement Category	Compliance Status	Action Required
Valid Driving License	REQUIRED	Verify license category matches vehicle type
Vehicle Registration	REQUIRED	Ensure current registration is valid
Vehicle Insurance	REQUIRED	Valid comprehensive insurance is necessary
Route Permits	CONDITIONAL	Required for interstate/heavy vehicle operations
AIS-140 GPS Device	REQUIRED	Install certified GPS tracking device
Driving Time Limits	REQUIRED	Maximum 10 hours of continuous driving
Vehicle Fitness Certificate	REQUIRED	Ensure valid pollution & fitness certificates
Driver Medical Certificate	REQUIRED	Maintain a valid medical fitness certificate

COMPLIANCE ISSUES REQUIRING IMMEDIATE ATTENTION

1. AIS-140 GPS tracking device required - Address before travel
2. Heavy vehicle - weight restrictions may apply - Address before travel

APPLICABLE REGULATORY FRAMEWORK

* Motor Vehicles Act, 1988 - Vehicle registration and licensing requirements
* Central Motor Vehicles Rules, 1989 - Technical specifications and safety
* AIS-140 Standards - GPS tracking and panic button requirements
* Road Transport and Safety Policy (RTSP) - Driver working hours
* Interstate Transport Permits - Required for commercial interstate travel
* Pollution Control Board Norms - Emission standards compliance
* Goods and Services Tax (GST) - Tax compliance for commercial transport
* Road Safety and Transport Authority - State-specific requirements

COMPLIANCE RECOMMENDATIONS

1. Ensure all vehicle documents are current and accessible
2. Verify the driver license category matches vehicle type
3. Check route-specific permits and restrictions
4. Install AIS-140 compliant GPS tracking device

NON-COMPLIANCE PENALTIES & CONSEQUENCES

* Driving without valid license: Fine up to Rs 5,000 + imprisonment
* Vehicle without registration: Fine up to Rs 10,000 + vehicle seizure
* No insurance: Fine up to Rs 2,000 + vehicle seizure
* AIS-140 non-compliance: Permit cancellation + heavy fines
* Overloading violations: Fine Rs 20,000 + per excess ton
* Driving time violations: License suspension + fines
* Interstate without permits: Vehicle seizure + penalty
* Environmental violations: Fine up to Rs 10,000 + registration cancellation

COMPREHENSIVE ELEVATION & TERRAIN ANALYSIS - LOW RISK (Risk Score: 0.5)

Description	Value
Data Source	SRTM (Shuttle Radar Topography Mission) DEM (Digital Elevation Model) data (30m resolution), Topographic maps
Total Analysis Points	~100 elevation points sampled at 100 m intervals along the route (~10-12 km)
Minimum Elevation	214 m above sea level
Maximum Elevation	236 m above sea level
Average Elevation	225 m above sea level
Total Elevation Range	22 m (very minimal variation)
Terrain Classification	Flat Plains Terrain – Alluvial Soil (Indo-Gangetic Plain)
Driving Difficulty Level	Very Easy - No sharp slopes or rugged surfaces
Fuel Consumption Impact	Minimal - No gradient resistance; consistent throttle level
Significant Changes Detected	None - No sudden elevation gain/loss >5 m/km observed

TERRAIN CHARACTERISTICS & DRIVING CONDITIONS

Factor	Observation / Recommendation
Elevation Change	<20 m across the entire route
Ground Type	Stable alluvial soil - typical of Indo-Gangetic plains
Route Complexity	Straightforward – no hills, valleys, or obstacles
Recommended Terrain Classification	"Plains Terrain – Easy" – ideal for transportation and infrastructure projects
Engineering Requirement	Minimal grading or earthwork needed

ELEVATION-BASED DRIVING CHALLENGES

Factor	Details
Gradient	Very gentle throughout (<1.5% max slope); minimal driving resistance
Sharp Ascents/Descents	None detected - flat terrain typical of alluvial plains
Drainage Crossings	Minor culverts/canal crossings may cause bumpy segments, especially during monsoon
Dusty Roads or Soft Shoulders	In the village outskirts, soft ground post-rain may affect traction slightly
Visibility Impact from Terrain	Zero elevation-related blind spots
Overtaking Risk Zones	Encouraged due to flatness, but caution is advised on narrow rural roads during traffic

Conclusion: No elevation-based driving challenges detected.Road surface condition and traffic are more critical than terrain.

ELEVATION-SPECIFIC VEHICLE PREPARATION

Checklist Item	Recommendation
Braking System	Standard brake health check is sufficient – no steep descents
Transmission/Gear Handling	No need for gear downshifting - standard torque handling is adequate
Coolant System	Normal levels sufficient – no elevation-induced overheating risk
Suspension Check	Recommended if crossing unpaved or bumpy canal sections
Tire Pressure	Maintain OEM-recommended PSI – no elevation-related adjustments needed
Load Management	Full commercial load allowed – no climb-induced torque concerns

Conclusion: Standard vehicle maintenance is adequate.No special elevation-based prep required.

FUEL CONSUMPTION IMPACT ANALYSIS

Factor	Impact
Flat Terrain	Promotes consistent throttle control, reduces braking/acceleration frequency
Elevation Variation	Negligible – within 22 m band; no fuel impact from climbs
Traffic Stops / Speed Variance	Minor impact at junctions; more related to congestion than terrain
Route Type	Industrial roads + rural highways – mostly 2nd to 4th gear driving
Estimated Fuel Consumption Impact	Diesel trucks: ~11–15 km/l

Conclusion: Flat terrain enhances fuel efficiency.Fuel usage will be more affected by road quality and traffic than by elevation.

FINAL SUMMARY & ROUTE CLASSIFICATION

Route Type: Flat Plains (Alluvial Soil)
Classification: "Plains Terrain – Easy"
Driving Difficulty: Very Low
Infrastructure Suitability: High – suitable for all types of transport and development
Special Considerations:
• Monsoon season may affect drainage crossings
• Post-rain conditions may soften shoulders in rural areas

COMPREHENSIVE TRAFFIC ANALYSIS LOW RISK (Risk Score: 2.8)

Metric	Value
Route Segments Analyzed	11
Overall Traffic Score	97.5 / 100
Traffic Condition	EXCELLENT
Average Travel Time Index	0.76
Average Current Speed	68.3 km/h
Average Free Flow Speed	51.8 km/h
Heavy Traffic Segments	0
Moderate Traffic Segments	0
Free Flow Segments	11
Worst Congestion Areas	0.0% of the route

TRAFFIC-BASED RECOMMENDATIONS

1. Check current traffic conditions before departure
2. Consider public transportation alternatives for heavily congested routes
3. Plan rest stops during low-traffic segments

COMPREHENSIVE ROAD QUALITY & SURFACE CONDITIONS(Risk Score :2.1)

Description	Value
Total Analysis Points	11
Road Quality Issues Detected	11
Critical Condition Areas	0
High Risk Areas	0
Medium Risk Areas	11
Analysis Confidence	Medium

IDENTIFIED ROAD QUALITY ISSUES (11 Locations)

Location (GPS)	Map link	Road Type	Surface Quality	Width (m)	Under Construction	Risk Score	Severity
21.22553,81.78316	View	highway	good	7	No	3	medium
21.18766,81.96269	View	highway	good	7	No	3	medium
21.18724,82.08258	View	highway	good	7	No	3	medium
21.22334,82.29905	View	highway	good	7	No	3	medium
21.25302,82.49239	View	highway	good	7	No	3	medium
21.28945,82.63679	View	highway	good	7	No	3	medium
21.28445,82.81585	View	highway	good	7	No	3	medium
21.30513,83.01606	View	highway	good	7	No	3	medium
21.44498,83.10026	View	highway	good	7	No	3	medium
21.54416,83.12831	View	highway	good	7	No	3	medium
21.684,83.19157	View	highway	good	7	No	3	medium

VEHICLE-SPECIFIC ROAD QUALITY RECOMMENDATIONS

- Heavy vehicles: Reduce speed by 20% in areas with road quality scores below 6/10
- Check tire pressure more frequently when traveling through poor surface areas
- Increase following distance by 50% in road quality risk zones
- Plan additional maintenance checks after routes with multiple road quality issues
- Consider alternative routes for high-value or sensitive cargo in critical condition areas
- Carry emergency repair kit for tire damage in poor road surface zones

COMPREHENSIVE ENVIRONMENTAL ASSESSMENT

Environmental Metric	Value
Total Analysis Points	0
Eco-Sensitive Zones	0
Air Quality Risk Areas	0
Weather Hazard Zones	0
Seasonal Risk Areas	0
Primary Risk Level	Low
API Sources Used	Open Weather, Visual Crossing, Tomorrow.io, Google Places

ENVIRONMENTAL COMPLIANCE & BEST PRACTICES

- Comply with National Green Tribunal (NGT) regulations in eco-sensitive zones
- Follow Central Pollution Control Board (CPCB) emission standards
- Adhere to Wildlife Protection Act requirements in sanctuary areas
- Implement noise control measures during night hours in sensitive zones
- Ensure vehicle PUC (Pollution Under Control) certificate is current
- Carry emergency spill containment kit for hazardous cargo

COMPREHENSIVE EMERGENCY PREPAREDNESS: LOW RISK (Risk Score: 2.8)

EMERGENCY SERVICES AVAILABILITY ASSESSMENT

Service Type	Availability Status
Medical Facilities (Hospitals)	32 facilities identified
Law Enforcement (Police)	1 stations identified
Fire & Rescue Services	1 stations identified
Emergency Clinics	32 clinics identified
Pharmacies (24hr)	32 pharmacies identified
Communication Reliability	0.0% coverage
Coverage Gaps	16 dead zones, 0 weak signal areas
Overall Service Coverage	POOR

CRITICAL EMERGENCY CONTACT NUMBERS - MEMORIZE OR SAVE

Emergency Service	Contact Number	When to Call	Response Type
National Emergency	112	Any life-threatening situation	Police / Fire / Medical
Police Emergency	100	Crime, accidents, theft	Law Enforcement
Fire Services	101	Fire, rescue, hazardous material	Fire & Rescue Team
Medical Emergency	108	Accidents, health emergencies	Ambulance Service
Highway Patrol	1033	Highway accidents, traffic support	Traffic Police
Women Helpline	1091	Women in distress	Women Safety Assistance
Disaster Management	1078	Natural disasters, emergencies	Disaster Response Team
Tourist Helpline	1363	Tourist-related emergencies or support	Tourist Support

Emergency Situation Standard Operating Procedure (SOP)

ROAD ACCIDENT PROTOCOL

Applicable to: Collision, crash, hitting stationary objects, or injury to personnel.

Immediate Actions:

- Stop the vehicle safely; engage handbrake, switch on hazard lights.
- Check for injuries; call 108 for ambulance if required.
- Inform control room or transport coordinator (via phone or VHF radio).
- Take photographs of damage, road conditions, and position of vehicles.
- If serious: Inform Police (100) and wait for clearance.
- Record witness contact (if any) and note surrounding conditions.

Driver Must Have:

- First aid kit
- Emergency contact card (Appendix B)
- Accident report form

VEHICLE BREAKDOWN PROTOCOL

Applicable to: Engine failure, tire burst, brake malfunction, fuel issues

Immediate Actions:

- Pull over to safe zone; place reflective triangle 15m behind vehicle
- Use flashers and hazard lights to alert other road users
- Inform Control Room and nearest Highway Patrol (1033)
- Attempt minor fixes if safe (replace tire, check fuses)
- Call backup vehicle if repair not possible within 30 min

Caution: Do not attempt repair in curves, blind spots, or eco-sensitive zones.

WILDLIFE ENCOUNTER PROTOCOL

Applicable to: Forest fringe, wildlife corridor.

Immediate Actions:

- Do NOT honk, rev engine, or flash headlights
- Stop the vehicle quietly at a safe distance
- Monitor movement through side mirrors; do not exit vehicle
- Inform control room only if delay >15 min
- Take photos only if safe; do not get out

DO NOT:

- Litter or feed animals
- Use loud sounds or lights
- Exit vehicle in wildlife corridor

MEDICAL EMERGENCY PROTOCOL

Applicable to: Driver illness, passenger discomfort, heatstroke, trauma.

Immediate Actions:

- Park vehicle safely
- Apply basic first aid from onboard kit
- Call 108 or direct to nearest hospital (Appendix B)
- Guide emergency team using GPS coordinates from report
- Record incident time, symptoms, action taken