



IndianOil

JOURNEY RISK MANAGEMENT (JRM) STUDY

Gorakhpur LPG BP TO GAINJAHAWA INDANE GR

Objective of the JRM Report

This JRM report is designed to ensure compliance with the Central Motor Vehicle Rules, 1989 (CMVR), AIS 140 standards, and the Road Transport Safety Policy (RTSP). It provides a comprehensive risk assessment for the transportation of hazardous materials along specified routes. By integrating these legal frameworks, the report offers a broad strategy for identifying and mitigating route-specific risks.

Regulatory Compliance

The report complies with the Central Motor Vehicles (Eleventh Amendment) Rules, 2022, mandating safe transportation practices for N2 and N3 category vehicles carrying hazardous materials. These rules require detailed route assessments, especially regarding road conditions, speed limits, and risk areas, to ensure safety compliance.

Risk Management Strategy

This report categorizes transportation routes into high-risk and medium-risk areas, with a focus on factors such as sharp turns, accident-prone regions, and elevation changes. The goal is to provide actionable

recommendations to minimize these risks, including speed regulations, driver warnings for hazardous zones, and the option of alternate routes.

Compliance with the Road Transport Safety Policy (RTSP)

The report integrates RTSP provisions, including mandatory driving hours, rest periods, and nighttime driving restrictions. It ensures that drivers follow official guidelines, such as taking prescribed rest breaks and avoiding dangerous road conditions like poor visibility, heavy crowds, or high-traffic areas during peak hours.

Emergency Preparedness and Response

The report highlights the significance of predetermined emergency stops for refueling, rest, and overnight stays. It includes protocols for safe responses to road hazards, alternative routes, and rerouting processes if roads are closed or severe weather arises. This aligns with the RTSP emphasis on driver safety and rapid emergency response.

Environmental Considerations

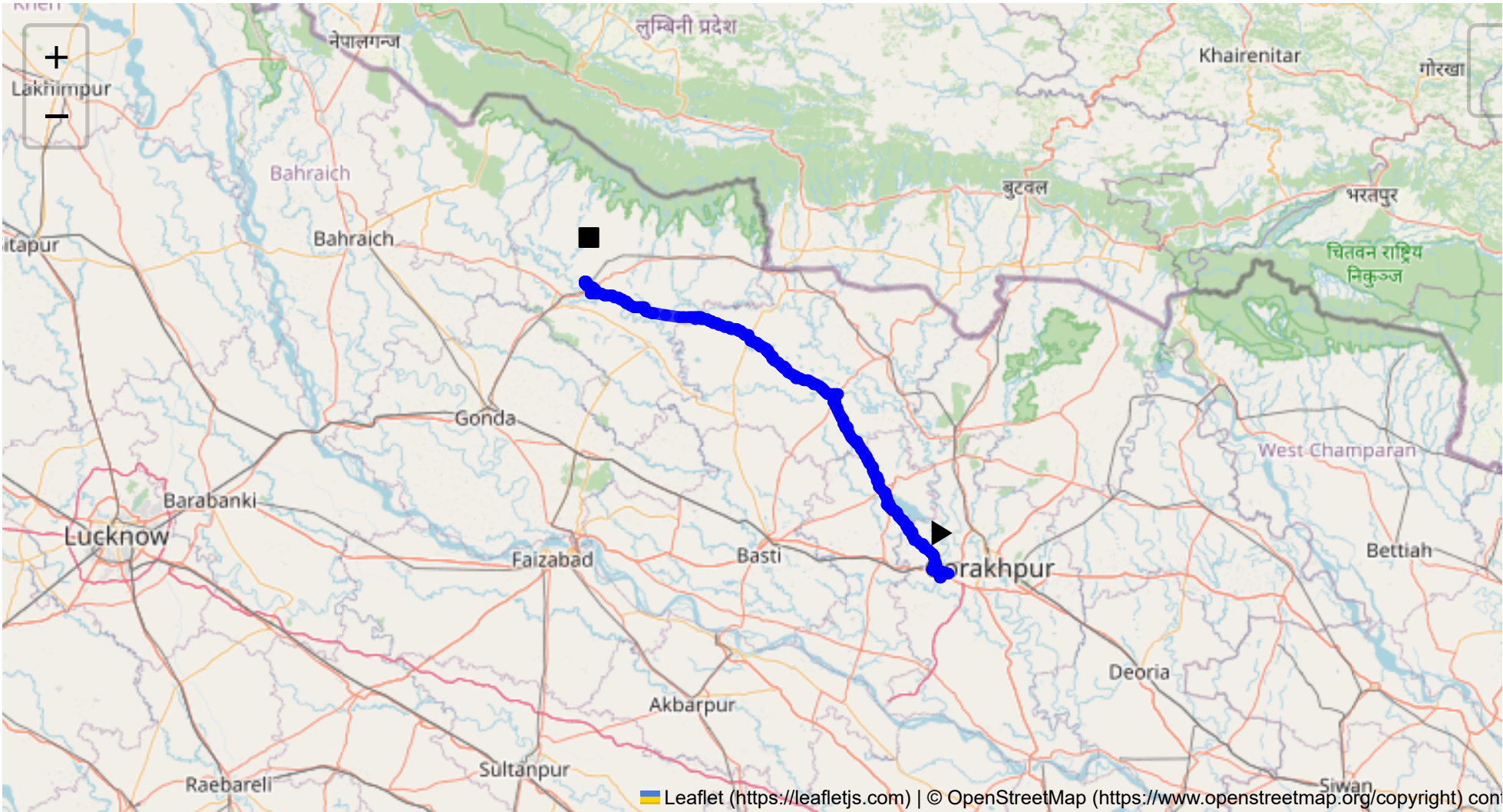
The JRM report addresses environmental risks along the route, ensuring compliance with environmental protection laws in ecologically sensitive zones. It suggests strategies such as identifying areas near water bodies, forests, or populated regions and implementing safety measures to minimize environmental impacts during transport.

Journey Risk Mitigation

The report includes route-specific risk assessments, detailed journey charts, and defensive driving guidelines for each transport route. Integration with vehicle tracking systems guarantees real-time warnings on hazardous areas, speed limits, and mandatory stops, consistent with RTSP and CMVR safety norms.

Compliance with Government Directives

This report fully adheres to governmental directives regarding hazardous material transportation, implementing mandatory speed limits, nighttime driving restrictions, and comprehensive driver briefings and real-time alerts about route-related risks.



Route Summary:
Total Distance: 158.57 km
Estimated Duration: 4.0 hours
Adjusted Duration (Heavy Vehicle): 5.0 hours
Start: (26.735959, 83.229398)
End: (27.471596, 82.24165)

Welcome to the Journey Risk Management Study

1. Overview of the Route Map

The route from GIDA Industrial Area Phase 1, Sahjanwa to Muda Dih via the specified waypoints involves navigating through a mix of industrial, semi-urban, and rural areas in Uttar Pradesh. It covers approximately 158.57 kilometers and passes through key locations such as Zero Point in Kaalesar, Nandaur in Mahdewa, and SH 1A in Benijot.

2. Typical Weather Conditions and Potential Weather-Related Hazards

Uttar Pradesh generally experiences a humid subtropical climate. Summers can be extremely hot, while the monsoon season, from June to September, often brings heavy rainfall, leading to water-logged roads, reduced visibility, and potential flooding. Winters can bring fog, especially in rural areas, reducing visibility and increasing the risk of accidents.

3. Analysis of Traffic Patterns

Traffic congestion is most likely around industrial areas such as GIDA Industrial Area Phase 1 due to high truck activity. Peak hours typically are in the morning (8-10 AM) and evening (5-7 PM). Roads near small towns and cities can experience slow-moving traffic due to local markets and pedestrians, especially in areas with narrow roads.

4. Assessment of Road Quality and Infrastructure

Road conditions vary across the route. While some stretches, particularly the state highways like SH 1A, are relatively well-maintained, other parts, especially rural roads, may have potholes, uneven surfaces, and poor signage. Infrastructure such as bridges or culverts may have load restrictions or require careful navigation.

5. Suggestions for Alternative Routes for Emergencies

In the event of roadblocks or severe congestion, alternative routes could involve taking other state highways or district roads that circumvent major towns. Specific alternative routes would depend on real-time traffic conditions and the nature of the emergency.

6. Summary of Local Regulations Affecting Hazardous Material Transport

Transporting hazardous materials requires compliance with local regulations, such as ensuring proper labeling, following routing restrictions, and adhering to safety protocols. Night travel might have additional restrictions due to reduced monitoring and emergency response capabilities.

7. Overview of Historical Incidents Involving Heavy Vehicles or Hazardous Materials

Historical data indicate occasional incidents, such as vehicle overturns and spills, often due to poor road conditions or driver error. Areas with a higher frequency of incidents include narrow turns or where roads are poorly lit at night.

8. Environmental Considerations and Sensitive Areas

Passing through rural areas, there might be sensitive locations near water bodies and agricultural fields, where spills could significantly impact local ecosystems. Drivers should ensure utmost care near these

sites and adhere to environmental safety protocols.

9. Analysis of Communication Coverage

Most of the route has mobile network coverage, but rural stretches between smaller towns might have weaker or intermittent signals, particularly in wooded or low-lying areas. It's advisable to keep communication equipment in good working condition and have alternative means (e.g., satellite phones) for critical communications.

10. Estimated Emergency Response Times for Different Route Segments

Response times will vary, with faster responses expected near major towns and slower times in rural or remote areas. In urban and semi-urban areas, expect response times between 30-45 minutes, while rural stretches could see delays up to 1-2 hours, depending on the proximity of emergency services.

12. Overall Summary of Risk Assessment

The route presents several risks primarily due to variable road quality, potential for adverse weather, traffic congestion during peak hours, and communication dead zones. Key recommendations for drivers include careful trip planning to avoid peak traffic times, remaining updated on weather conditions, and ensuring all safety protocols for hazardous materials are rigorously followed. Awareness and preparedness for dealing with varying road conditions and ensuring clear communication channels are maintained will enhance safety during transit.

Risk Assessment - Turns

| | Risk Type | Risk Level | Coordinates | Speed Limit | Distance from Start |
|----|------------|------------|------------------------|-------------|---------------------|
| 1 | Turn | High | 26.73746, 83.22938 | 15 KM/Hr | 0.08 km |
| 2 | Turn | High | 26.73812, 83.22630 | 15 KM/Hr | 0.32 km |
| 3 | Turn | High | 26.74524, 83.22746 | 15 KM/Hr | 1.13 km |
| 4 | Turn | High | 26.74679, 83.22391 | 15 KM/Hr | 1.48 km |
| 5 | Blind Spot | Blind Spot | 26.75126, 83.22476 | 10 KM/Hr | 2.12 km |
| 6 | Blind Spot | Blind Spot | 26.75377, 83.20465 | 10 KM/Hr | 4.14 km |
| 0 | U-Turn | High | 26.7471208, 83.2490873 | 10 KM/Hr | 8.55 km |
| 7 | Blind Spot | Blind Spot | 26.74709, 83.24877 | 10 KM/Hr | 8.55 km |
| 8 | Blind Spot | Blind Spot | 26.75370, 83.20463 | 10 KM/Hr | 12.70 km |
| 9 | Turn | High | 26.75381, 83.21323 | 15 KM/Hr | 13.97 km |
| 10 | Turn | Medium | 26.75436, 83.21340 | 30 KM/Hr | 14.01 km |

| | Risk Type | Risk Level | Coordinates | Speed Limit | Distance from Start |
|----|------------|------------|--------------------|-------------|---------------------|
| 11 | Turn | High | 26.75640, 83.21275 | 15 KM/Hr | 14.16 km |
| 12 | Blind Spot | Blind Spot | 26.76132, 83.21435 | 10 KM/Hr | 14.68 km |
| 13 | Turn | High | 26.76131, 83.21143 | 15 KM/Hr | 15.03 km |
| 14 | Turn | High | 26.76382, 83.21122 | 15 KM/Hr | 15.38 km |
| 15 | Turn | High | 26.76593, 83.21408 | 15 KM/Hr | 15.70 km |
| 16 | Turn | Medium | 26.81740, 83.18022 | 30 KM/Hr | 22.65 km |
| 17 | Turn | Medium | 26.83008, 83.15664 | 30 KM/Hr | 25.38 km |
| 18 | Turn | Medium | 26.84881, 83.14936 | 30 KM/Hr | 27.50 km |
| 19 | Turn | Medium | 26.86197, 83.13749 | 30 KM/Hr | 29.50 km |
| 20 | Turn | Medium | 26.91348, 83.08869 | 30 KM/Hr | 37.02 km |
| 21 | Turn | High | 26.91581, 83.08479 | 15 KM/Hr | 37.53 km |
| 22 | Blind Spot | Blind Spot | 26.91433, 83.08351 | 10 KM/Hr | 37.94 km |
| 23 | Turn | Medium | 26.91903, 83.08104 | 30 KM/Hr | 38.46 km |
| 24 | Turn | Medium | 26.92307, 83.08177 | 30 KM/Hr | 38.78 km |
| 25 | Turn | Medium | 26.94884, 83.07110 | 30 KM/Hr | 41.99 km |
| 26 | Turn | Medium | 26.98401, 83.04941 | 30 KM/Hr | 46.67 km |
| 27 | Turn | Medium | 27.00817, 83.03794 | 30 KM/Hr | 49.44 km |
| 28 | Turn | High | 27.07137, 82.99515 | 15 KM/Hr | 57.77 km |
| 29 | Turn | High | 27.07059, 82.99365 | 15 KM/Hr | 57.99 km |
| 30 | Turn | Medium | 27.07376, 82.98855 | 30 KM/Hr | 58.64 km |
| 31 | Turn | Medium | 27.16987, 82.93403 | 30 KM/Hr | 70.50 km |
| 32 | Turn | High | 27.17201, 82.92833 | 15 KM/Hr | 71.34 km |
| 33 | Turn | High | 27.18012, 82.92766 | 15 KM/Hr | 72.21 km |
| 34 | Turn | Medium | 27.18439, 82.93374 | 30 KM/Hr | 72.90 km |
| 35 | Turn | High | 27.18422, 82.93533 | 15 KM/Hr | 73.16 km |
| 36 | Turn | High | 27.19046, 82.94032 | 15 KM/Hr | 73.73 km |
| 37 | Turn | High | 27.19102, 82.94019 | 15 KM/Hr | 74.13 km |
| 38 | Turn | Medium | 27.18951, 82.92464 | 30 KM/Hr | 75.57 km |
| 39 | Turn | Medium | 27.25708, 82.79037 | 30 KM/Hr | 91.43 km |
| 40 | Turn | Medium | 27.25883, 82.78982 | 30 KM/Hr | 91.60 km |
| 41 | Turn | Medium | 27.28178, 82.75980 | 30 KM/Hr | 95.44 km |
| 42 | Turn | Medium | 27.28489, 82.75905 | 30 KM/Hr | 95.81 km |
| 43 | Turn | Medium | 27.31177, 82.72370 | 30 KM/Hr | 100.50 km |
| 44 | Turn | High | 27.31458, 82.72270 | 15 KM/Hr | 100.90 km |

| | Risk Type | Risk Level | Coordinates | Speed Limit | Distance from Start |
|----|------------|------------|--------------------|-------------|---------------------|
| 45 | Turn | Medium | 27.31604, 82.71611 | 30 KM/Hr | 101.59 km |
| 46 | Turn | Medium | 27.32224, 82.70231 | 30 KM/Hr | 103.05 km |
| 47 | Turn | Medium | 27.36986, 82.58930 | 30 KM/Hr | 115.85 km |
| 48 | Turn | Medium | 27.37855, 82.54452 | 30 KM/Hr | 120.79 km |
| 49 | Turn | Medium | 27.40357, 82.40100 | 30 KM/Hr | 135.56 km |
| 50 | Turn | High | 27.40603, 82.40026 | 15 KM/Hr | 135.92 km |
| 51 | Turn | High | 27.40764, 82.39150 | 15 KM/Hr | 136.79 km |
| 52 | Turn | Medium | 27.40659, 82.39066 | 30 KM/Hr | 137.02 km |
| 53 | Turn | Medium | 27.43746, 82.31257 | 30 KM/Hr | 145.20 km |
| 54 | Blind Spot | Blind Spot | 27.44071, 82.25418 | 10 KM/Hr | 150.91 km |
| 55 | Turn | High | 27.45064, 82.26414 | 15 KM/Hr | 153.03 km |
| 56 | Turn | Medium | 27.45565, 82.25906 | 30 KM/Hr | 153.77 km |
| 57 | Turn | Medium | 27.45906, 82.24875 | 30 KM/Hr | 154.72 km |
| 58 | Turn | Medium | 27.45860, 82.24578 | 30 KM/Hr | 155.28 km |
| 59 | Turn | High | 27.46579, 82.23639 | 15 KM/Hr | 156.46 km |
| 60 | Turn | Medium | 27.46848, 82.23749 | 30 KM/Hr | 156.81 km |
| 61 | Turn | High | 27.46906, 82.23728 | 15 KM/Hr | 156.92 km |
| 62 | Turn | Medium | 27.47031, 82.23809 | 30 KM/Hr | 157.03 km |

Route Photos of Risky Spots



Risk Type: Blind Spot
Risk Level: Blind Spot

Speed Limit: 10 KM/Hr
Distance from Start: 2.12 km
Coordinates: 26.75126, 83.22476



Risk Type: Blind Spot
Risk Level: Blind Spot
Speed Limit: 10 KM/Hr
Distance from Start: 4.14 km
Coordinates: 26.75377, 83.20465



Risk Type: U-Turn
Risk Level: High
Speed Limit: 10 KM/Hr
Distance from Start: 8.55 km
Coordinates: 26.7471208, 83.2490873



Risk Type: Blind Spot
Risk Level: Blind Spot
Speed Limit: 10 KM/Hr
Distance from Start: 8.55 km
Coordinates: 26.74709, 83.24877



Risk Type: Blind Spot
Risk Level: Blind Spot
Speed Limit: 10 KM/Hr
Distance from Start: 12.70 km
Coordinates: 26.75370, 83.20463



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr
Distance from Start: 13.97 km
Coordinates: 26.75381, 83.21323



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Distance from Start: 14.01 km
Coordinates: 26.75436, 83.21340



Risk Type: Turn

Risk Level: High

Speed Limit: 15 KM/Hr

Distance from Start: 14.16 km

Coordinates: 26.75640, 83.21275



Risk Type: Blind Spot

Risk Level: Blind Spot

Speed Limit: 10 KM/Hr

Distance from Start: 14.68 km

Coordinates: 26.76132, 83.21435



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr
Distance from Start: 15.03 km
Coordinates: 26.76131, 83.21143



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr
Distance from Start: 15.38 km
Coordinates: 26.76382, 83.21122



Risk Type: Turn

Risk Level: High

Speed Limit: 15 KM/Hr

Distance from Start: 15.70 km

Coordinates: 26.76593, 83.21408



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Distance from Start: 22.65 km

Coordinates: 26.81740, 83.18022



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Distance from Start: 25.38 km
Coordinates: 26.83008, 83.15664



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Distance from Start: 27.50 km
Coordinates: 26.84881, 83.14936



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Distance from Start: 29.50 km
Coordinates: 26.86197, 83.13749



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Distance from Start: 37.02 km
Coordinates: 26.91348, 83.08869



Risk Type: Turn

Risk Level: High

Speed Limit: 15 KM/Hr

Distance from Start: 37.53 km

Coordinates: 26.91581, 83.08479



Risk Type: Blind Spot

Risk Level: Blind Spot

Speed Limit: 10 KM/Hr

Distance from Start: 37.94 km

Coordinates: 26.91433, 83.08351





Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Distance from Start: 41.99 km
Coordinates: 26.94884, 83.07110



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Distance from Start: 46.67 km
Coordinates: 26.98401, 83.04941



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Distance from Start: 49.44 km
Coordinates: 27.00817, 83.03794



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr
Distance from Start: 57.77 km
Coordinates: 27.07137, 82.99515



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr
Distance from Start: 57.99 km
Coordinates: 27.07059, 82.99365



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Distance from Start: 58.64 km
Coordinates: 27.07376, 82.98855



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Distance from Start: 70.50 km
Coordinates: 27.16987, 82.93403



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr
Distance from Start: 71.34 km
Coordinates: 27.17201, 82.92833



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr
Distance from Start: 72.21 km
Coordinates: 27.18012, 82.92766



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Distance from Start: 72.90 km
Coordinates: 27.18439, 82.93374



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr
Distance from Start: 73.16 km
Coordinates: 27.18422, 82.93533



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr
Distance from Start: 73.73 km
Coordinates: 27.19046, 82.94032



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr
Distance from Start: 74.13 km
Coordinates: 27.19102, 82.94019



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Distance from Start: 75.57 km
Coordinates: 27.18951, 82.92464



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Distance from Start: 91.43 km

Coordinates: 27.25708, 82.79037



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Distance from Start: 91.60 km

Coordinates: 27.25883, 82.78982



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Distance from Start: 95.44 km
Coordinates: 27.28178, 82.75980



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Distance from Start: 95.81 km
Coordinates: 27.28489, 82.75905



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Distance from Start: 100.50 km

Coordinates: 27.31177, 82.72370



Risk Type: Turn

Risk Level: High

Speed Limit: 15 KM/Hr

Distance from Start: 100.90 km

Coordinates: 27.31458, 82.72270



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Distance from Start: 101.59 km
Coordinates: 27.31604, 82.71611



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Distance from Start: 103.05 km
Coordinates: 27.32224, 82.70231



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Distance from Start: 115.85 km
Coordinates: 27.36986, 82.58930



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Distance from Start: 120.79 km
Coordinates: 27.37855, 82.54452



Risk Type: Turn

Risk Level: High

Speed Limit: 15 KM/Hr

Distance from Start: 135.92 km

Coordinates: 27.40603, 82.40026



Risk Type: Turn

Risk Level: High

Speed Limit: 15 KM/Hr

Distance from Start: 136.79 km

Coordinates: 27.40764, 82.39150



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Distance from Start: 137.02 km

Coordinates: 27.40659, 82.39066



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Distance from Start: 145.20 km

Coordinates: 27.43746, 82.31257



Risk Type: Blind Spot
Risk Level: Blind Spot
Speed Limit: 10 KM/Hr
Distance from Start: 150.91 km
Coordinates: 27.44071, 82.25418



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr
Distance from Start: 153.03 km
Coordinates: 27.45064, 82.26414

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