NSSR Handbook for Commercial Vehicles (BUSES)

By

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V 1.02.2025

Commercial vehicles are motor vehicles used for transporting “goods or paying passengers” for business purposes

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1. Due Acknowledgment

We extend our special gratitude to the Honorable Secretary of the National Safety Council, Bengaluru – Karnataka Chapter for enabling us to take up this pilot and survey for delivering a handbook on improving road safety via customer engagement sensitization, readiness and related exercises.

We wish to acknowledge our sincere gratitude for all valuable guidance and constructive suggestions in the preparation of the handbook.

We wish to acknowledge the automobile dealer network for the brand _____ in helping us evaluate a pilot of the handbook.

We thank all other people directly and indirectly connected to this mission of improving road safety.

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Cost Benefit Analysis for the NSSR-RS Handbook

Why is the NSSR-RS Handbook needed?

The NSSR-RS Handbook can help

- ❑ Condition assessment/Problem determinism
- ❑ Definitive Inventory
- ❑ Demand conditioning and enabling
- ❑ Customer Support for Anytime Anyhow and Anywhere service incorporation

The NSSR-RS Handbook can make a difference to

- ❑ Forward Lifetime investments for safe and sustainable commuting
- ❑ 4P(s) and 6M(s) for safety

The NSSR-RS programme views the following as important for its success:

- ❑ Infrastructure and Training facilities
- ❑ Training capacity/roadmap
- ❑ Training Instructors
- ❑ Centre of Excellence framework (**NSSR-RS-COE**)
- ❑ Continual consistency, control and commitment for the NSSR-RS curriculum

Editioning

- ❑ Digital form
- ❑ Printed form (size 29.7 cm x 21 cm)
- ❑ Online version
- ❑ NSSR-RS Pull-out Holder
- ❑ Social Responsibility Addition to any Vehicle Document Holder

Price-points

- ❑ Accelerates synergy for safe and sustainable commuting
- ❑ Adds and helps value perpetuation for social responsibility towards road safety
- ❑ Furthers Anytime-Anywhere-Anyhow service incorporation with Nth Line Support Liaison and Supply Chain Collaboration
- ❑ Granularity-Accountability-Transformability to reduce accidents via Active Culture, Commitment and Incorporation

2.a Understanding of commercial vehicles

Types of commercial vehicles

In India, the commercial vehicle market is broadly categorized into light commercial vehicles (LCVs) and medium commercial vehicles (MCVs) & heavy commercial vehicles (HCVs).

Light Commercial Vehicles (LCVs):

These are used for transporting relatively light goods or a limited number of passengers, like vans and pickup trucks.

Medium & Heavy Commercial Vehicles (MCVs & HCVs):

These vehicles are designed for transporting larger loads and heavier goods, such as trucks, buses, and heavy-duty vans.

Specialty Vehicles:

These vehicles are tailored for specific commercial needs, such as fire engines, ambulances, or specialized construction vehicles like hazardous goods transport vehicles, waste disposal trucks, tippers, tractor trailers, water rankers, etc.

Passenger Commercial Vehicles:

These vehicles are designed to transport passengers, like buses, school buses, and taxis.

2.b Understanding of commercial vehicles

Some common brands of commercial vehicles

- **Trucks:** Tata Ace Gold, Mahindra Jeeto, Mahindra Treo, Force Urbania, Maruti Suzuki Super Carry, Eicher Pro, Ashok Leyland Boss.
- **Buses:** Tata Motors, Eicher, Ashok Leyland.
- **Three-Wheelers (Auto-rickshaws):** Mahindra Treo, Bajaj RE, Piaggio Ape E city.
- **Three-Wheelers (Goods transportation):** Mahindra Treo, Piaggio Ape, Euler Motors HiLoad EV.
- **Vans:** Tata Intra, Mahindra Bolero Camper, Mahindra Bolero Pik-Up.
- **Pick-up Trucks:** Mahindra Bolero Big Pik Up.
- **Mini Trucks:** Tata Ace, Mahindra Supro.

2.c Understanding of commercial vehicles

Key considerations of commercial vehicles

- **Gross Vehicle Weight (GVW):** GVW determines the vehicle's capacity for carrying goods or passengers.
- **Fuel Type:** Commercial vehicles can be powered by diesel, petrol, CNG, or electric.
- **Payload Capacity:** This is the maximum weight a commercial vehicle can carry, for simpler understanding, when the vehicle in used for transporting goods.
- **Wheel base, Number of wheels/tires (known to use** radial or bias-ply construction)
- **Ground clearance: t**he distance between the ground and the lowest point of the vehicle, measured in millimeters.
- **Steering type: Hydraulic power assisted**
- **Safety systems: ABS, ESC, Designed for driver comfort, Build quality to mitigate crash impact**
- **Key specifications** include engine type, capacity, power output, torque, fuel tank capacity, transmission, brakes, suspension, tire size, wheelbase, and overall dimensions (length, width, height).
- **Awareness and Responsiveness to** ensure safe, well-maintained and optimally performing vehicle, assist and safety systems

3.Understanding of buses as commercial vehicles

Types of buses

- **City Buses**
- **Inter-city Buses**
- **Suburban Buses**
- **Tour Buses**
- **Staff & Contract Buses**
- **School Buses**

Key considerations for buses

- **Primary Function:** Passenger transport.
- **Capacity:** High passenger capacity, often with multiple rows of seats.
- **Features:** Comfort-focused seating, often with amenities like air conditioning and entertainment systems.
- **Value addition:** Fuel Monitoring System, Cruise Control, Gear Shift Advisor, Firmware over the air, Telemetry
- **Safety features:** Blind Spot Mirror, Anti-skid flooring, Panic button, Guard Rails, Emergency brakes with ABS

3.1 Understanding of buses as commercial vehicles

Value addition functions in buses

- ❑ Fuel Monitoring System
- ❑ Improved Engine Hood Installation
- ❑ Pagoda Gear Box
- ❑ Gear Shift Advisor
- ❑ E-Viscous Fan for engine cooling
- ❑ Cruise Control
- ❑ Gateway Domain Controller Unit for seamless communication, data exchange, and security
- ❑ Firmware over the air
- ❑ Fleet Management Telemetry
- ❑ USB Charging Ports

Need for Intelligent Transport Systems, Navigation, Perspective Vision and Feedback Systems that improve road system understanding for concerns like height and weight restrictions for vehicles, planning for pretexts such as bridges, tunnels, ring roads, flyovers, under-passes, need for emergency call features on route

3.2 Understanding of buses as commercial vehicles

Safety system functions in buses

- ❑ Top Maker Lamp
- ❑ Blind Spot Mirror, Indirect Vision Detection
- ❑ Heavy Duty Wiper
- ❑ Emergency Exit, Service Doors, Peep Windows
- ❑ Transparent Door
- ❑ Guard Rails
- ❑ Anti-skid flooring
- ❑ Panic button
- ❑ Safe Seat Upholstery with Grip Handle
- ❑ Seat Belt Anchorage, Lap Belt, Impact Shield

Instead of Air bags

- ❑ Hand hold Straps
- ❑ LED Destination Board

Safety system functions in buses

[ ] Fog Lamp
[ ] Reverse Parking Sensor
[ ] 7 Layer Exhaust Insulation
[ ] Fire Detection and Alarm System Indicators (in Engine Compartment, Passenger Areas and Luggage Areas)
[ ] Fire Detection Systems with Cable test for satisfactory behaviour, Repel test for insulation, Burning material behaviour tests
[ ] All Wheel Disc Brakes
[ ] Emergency Braking with ABS
[ ] Gear Level with Cable Shaft
[ ] Speed Deceleration Stop Lights
[ ] DRL Head/Tail Lamps
[ ] Unitized wheel bearing
[ ] Robust Multi-piece Propeller Shafts

4. Buses and Driving conditions responsiveness

Sensitized and Effective decision making

Driving condition responsiveness refers to how quickly and appropriately a driver reacts to changing road and traffic conditions. This includes their reaction time to hazards, their ability to maintain control of the vehicle, and their decision-making processes in varying scenarios. Factors like stress, fatigue, and driver ability can significantly impact this responsiveness.

Key Aspects of Responsiveness

Enforcement Directive networked Tachograph for Driving Time, Working Time and Rest periods

Reaction Time
Control over the vehicle
Defensive Driving practices
Sensitized or Effective Decision-making

Key Factors affecting Responsiveness

Driver Training/Evaluations
Driver Ability/Anticipatory Guidance
Driver Stress
Driver Alertness / Fatigue
Road and Traffic conditions
NSSR-RS Training Programme, Pre & Post ride checklists, instructions
Enforcement Directives for DT, WT and Rest
DT, WT and Rest Timings surveyed per state and across state borders

4. Buses and Driving conditions responsiveness

Sensitized and Effective Decision making

To develop more driving-condition-responsiveness in automobile brands, the universal & NSSR expectations in automobile brands for improving road safety are important.

The key contributors for driving-condition-responsiveness are

- ❑ Improved sales & marketing, service operations and process efficiency
- ❑ Connected & Responsive Quality of service enablers by the dealer network or independent automobile businesses
- ❑ New BI & CQI led Deep Interaction (DIL) links for a Service Centre's "RADIUS OF COVERAGE", "Road Safety Liability with Responsive Resolution" for dynamics seen in Road System understanding and Alpha Assistance
- ❑ Key opinion led nutshell inventory, parts management and disposal for a Service Centre's "RADIUS OF COVERAGE", "Road Safety Liability with Responsive Resolution"
- ❑ Functional inclusion of tachographs to record securely and transfer information about Driving Time (DT), Working Time (WT), and Rest time/periods with a cross checking of
- ✓ Strict rest time for drivers of tours & travels vehicles lasting 6 to 12 working days
- ✓ Maximum 8-hour DT and WT per day per week
- ✓ Compulsory day off or extended rest periods if duty exceeds regulated DT and WT
- ✓ Appropriate Rest periods between specific continuous hours of driving in a day
- ✓ Driver Training for difficult conditions or night driving

4. Buses and Driving conditions responsiveness

Defensive Driving (Areas of importance for safer and sustainable commuting by commercial vehicles)

- ❑ Safe and Fuel-efficient driving
- ❑ Awareness, knowledge and understanding of technical characteristics, benefits and operations of safety controls
- ❑ Limits and conditions for the use of brakes
- ❑ Better use of speed and gears
- ❑ Ways of slowing down and braking on downhill stretches, and factored decisions or actions to be taken in the event of a mechanical or active safety system failure
- ❑ Ability to help passengers find possible ways for safety and effectively use public & private infrastructure
- ❑ Dedicated Lane driving
- ❑ Managing conflicts between safe driving and other roles as a driver
- ❑ Interactions with passengers
- ❑ Knowing and understanding specific ness of certain passengers/ and target groups like children, the disabled, the commuters needing alpha assistance
- ❑ Knowledge and maximum working periods (Driving time, working time and rest) with the use of a tachograph

4. Buses and Driving conditions responsiveness

Defensive Driving (Areas of importance for safer and sustainable commuting by commercial vehicles)

- ❑ Knowledge of passenger expectations, luggage, need for safety equipment, need for seat belts, lap belts and other anchorage
- ❑ Knowledge of vehicle load rules and causation factors
- ❑ Awareness of traffic signs, road traffic risks, types of accidents in the transport sector and driving condition responsiveness, accident statistics, accident causation factors, consequences to vehicle, functional expectations, equipment, organizational and public human resources, materials, money involved
- ❑ Ability to respond to emergencies, concerning situations, accident-causing factors via training, and responsiveness for procedures of First Aid, Fire Evacuation/ Fire Detection & Response potential driver / passenger conflict situations, implications to the safety of passengers/commuters and the impactful issues for road safety
- ❑ Understanding of the importance of physical and mental wellbeing for road safety,, with the opting for “of a healthy lifestyle/diet, and avoidance of alcohol, drugs and other substances, and interests for decisions” known to affect behaviour/alertness, the adherence to work-rest cycles known to cause fatigued conditions

4. Buses and Driving conditions responsiveness

ii. **Active Safety Systems that universally help**

- ❑ Electronic Stability Control (ESC)
- ❑ Tyre Pressure Monitoring System
- ❑ Cruise Control / Adaptive Cruise Control
- ❑ Advanced Braking System / ABS
- ❑ Collision Avoidance Warning Systems / Forward Collision Warning Systems
- ❑ Lane Departure Warning Systems
- ❑ Driver Alert Control Systems
- ❑ Reverse Assist Systems
- ❑ Fuel Monitoring System

- ❑ Charter for Driver Fitness/Driver Training, Vehicle Fitness and Performance Analysis, Road System understanding, Alpha Assistance
- ❑ Periodic Inspection
- ❑ Pre-ride and Pot-ride checklists for fitness and system analysis
- ❑ Corrective Maintenance

Responsiveness for A-S-P and DI in operational environment
A: Awareness
S: Sensitization
P: Preparedness
DI: Deep Interaction

Engineering specification based parts, and components in buses

A preview

1. Engine and Powertrain:

Engine: The engine provides the power to propel the bus.

Transmission: Transfers power from the engine to the wheels.

Drivetrain: Includes components like the drive shaft and axles that transmit power.

Exhaust System: Manages exhaust gases from the engine.

2. Chassis:

Chassis: The structural frame of the bus, supporting the body and powertrain.

Axles and Bearings: Allow the wheels to rotate and support the weight of the bus.

Brakes: Control the bus's speed and stopping ability.

Suspension: Provides a smooth ride for passengers.

Steering System: Allows the driver to control the direction of the bus.

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3. Body:

Body Shell: The outer structure of the bus, made of materials like steel or aluminum.

Doors and Windows: Allow passengers to enter and exit the bus and provide visibility.

Mirrors: Provide the driver with a view of the bus's surroundings.

Lighting: Includes headlights, taillights, turn signals, and interior lighting.

Signage: Includes destination and route displays.

4. Electrical Systems:

Electrical Wiring: Provides power to all electrical components.

Battery: Stores electrical energy.

Alternator: Generates electricity while the engine is running.

Computer Systems: Control various aspects of the bus's operation.

5. Interior Features:

Seats: Provide seating for passengers.

Air Conditioning/Heating: Regulates the temperature inside the bus.

Audio System: Provides entertainment or announcements.

Emergency Equipment: Includes items like fire extinguishers and first aid kits.

Accessory Components: May include emergency hammers, handles, and other amenities

Active Safety Systems that help in buses

Are detailed in the main NSSR-RS for CV handbook: