

YOUR 2026-2027 ROAD SAFETY PLANNER

By
AOEC, Gap Analysis 2026-2027
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Available on purchase
Planner to sensitize,
review and implement
Quality promotion for
road safety

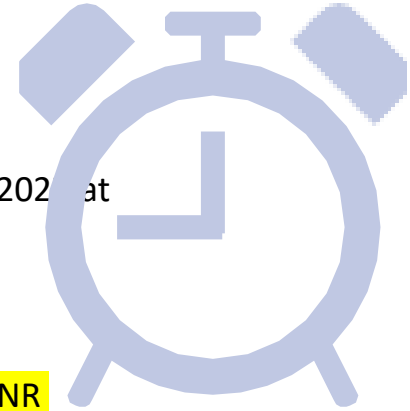


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Onboarding the Planners for MSME(s) and business organizations

- To get started, Please find our **Road Safety & Accountability Calendar** for the year 2026-2027
- To delve further, We offer subscription-based Road Safety & Accountability Planners (2) for the year 2026-2027 at the **price of INR 1,000/- for unlimited distribution** of the Planner PDF(s) to the departments/teams/employees/staff via our subscription-based website.
- To work ahead of baseline planning, We also provide solution finding for your specific Road Safety & Accountability needs via our case studies, empirical studies and NSC/NSSR training programmes priced **at INR 10,000 and above for an institution, its admissions & supportive management offices and business units/channels.**
- Contact us for more details or use the **included QR code / invoice details** for payments for unlimited distribution.



- Regards
- Venkatram K S and team
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UNIVERSAL
PLANNER



NSSR Objectives



SOCIAL
RESPONSIBILITY

SA 8000

NSSR **THEME**
HANDBOOKS

Voice of Value

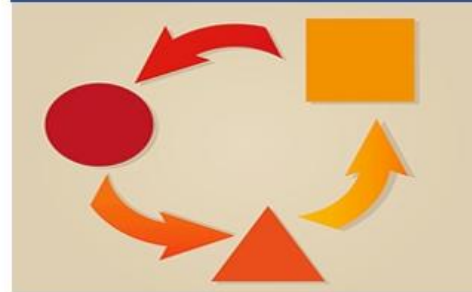
Innovation &
Improvement



Learning, Knowledge



Trends and
Investment Cycle



NSSR Theme
Quality
Promotion
for a Voice of
Value



Green Thinking



End of lifecycle



Lite emergence

Quality Promotion

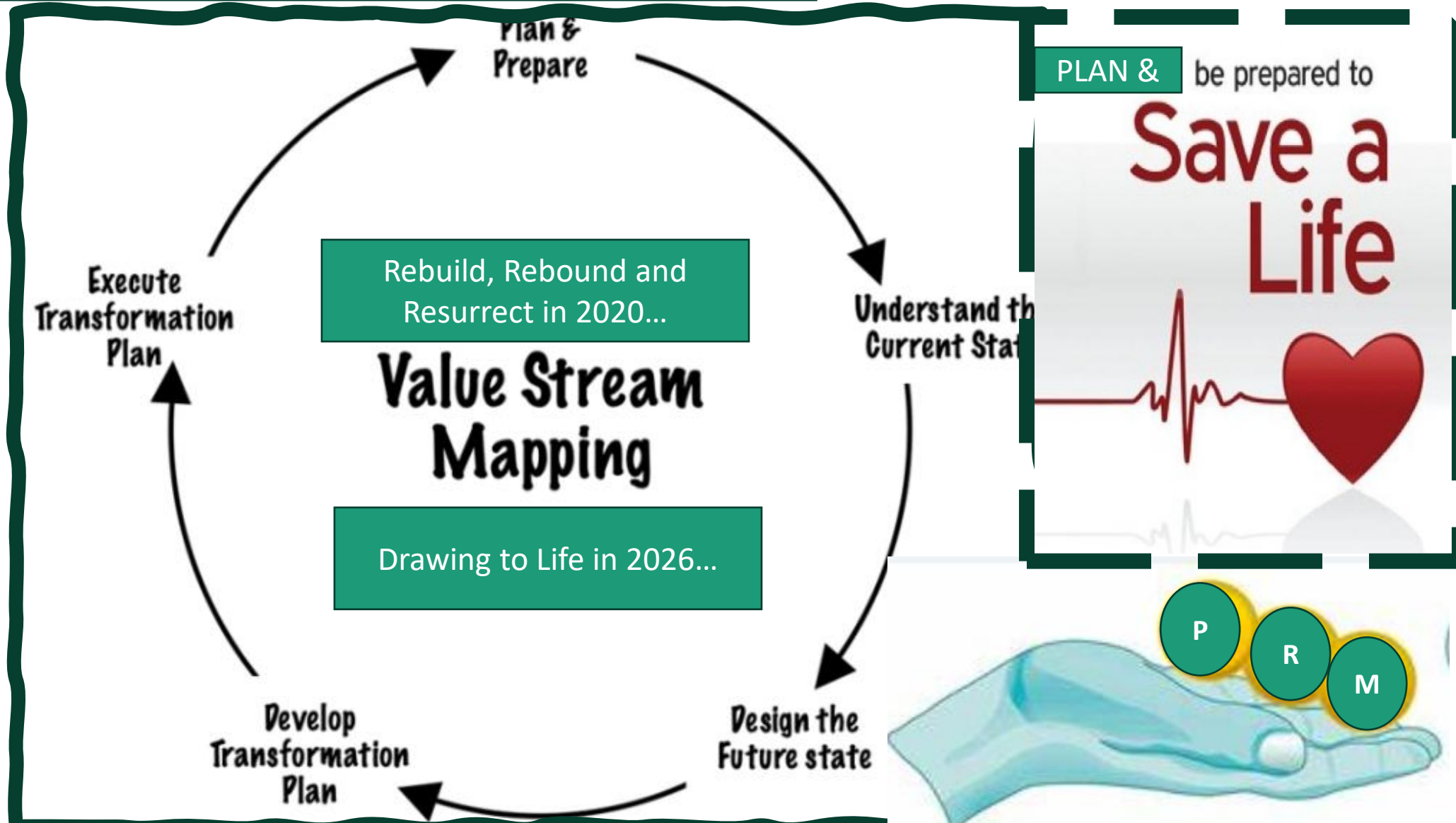
Value Stream
Mapping



UNIVERSAL ASSISTANCE



- ✓ *WE BELIEVE THAT helping people in being well informed is a year long motto rather than a visionary after-incidence-or-supportive policy.*
- ✓ *Our vision is to enable a business, organization, department, team, family or social circle with or without alpha (young, afflicted or impaired or aged) dependents to*
- ✓ *Use our Planner (though detailed) to be proactive for life saving health & wellness*
- ✓ *Use our different strategies and cards to plan what is to be done while experiencing a breakdown or incidence on-road*
- ✓ *Record important details for the year 2026 to keep safe and keep sensitized*



2026

January*

START OF THE YEAR GOAL SETTING



SUN		4	11	18	25
MON		5	12	19	26
TUE		6	13	20	27
WED		7	14	21	28
THU	1	8	15	22	29
FRI	2	9	16	23	30
SAT	3	10	17	24	31

2026 February



SUN	1	8	15	22	
MON	2	9	16	23	
TUE	3	10	17	24	
WED	4	11	18	25	
THU	5	12	19	26	
FRI	6	13	20	27	
SAT	7	14	21	28	

2026 March



SUN	1	8	15	22	29
MON	2	9	16	23	30
TUE	3	10	17	24	31
WED	4	11	18	25	
THU	5	12	19	26	
FRI	6	13	20	27	
SAT	7	14	21	28	

2026 April



SUN		5	12	19	26
MON		6	13	20	27
TUE		7	14	21	28
WED	1	8	15	22	29
THU	2	9	16	23	30
FRI	3	10	17	24	
SAT	4	11	18	25	

2026

May

MAY DAY / MID YEAR GOAL REVIEW



SUN	31	3	10	17	24
MON		4	11	18	25
TUE		5	12	19	26
WED		6	13	20	27
THU		7	14	21	28
FRI	1	8	15	22	29
SAT	2	9	16	23	30

2026 June



MONSOON SEASON ISSUES REVIEW

SUN		7	14	21	28
MON	1	8	15	22	29
TUE	2	9	16	23	30
WED	3	10	17	24	
THU	4	11	18	25	
FRI	5	12	19	26	
SAT	6	13	20	27	

2026 July



MONSOON SEASON ISSUES REVIEW

SUN		5	12	19	26
MON		6	13	20	27
TUE		7	14	21	28
WED	1	8	15	22	29
THU	2	9	16	23	30
FRI	3	10	17	24	31
SAT	4	11	18	25	

2026

August



MONSOON SEASON ISSUES REVIEW

SUN	30	2	9	16	23
MON	31	9	10	17	24
TUE		4	11	18	25
WED		5	12	19	26
THU		6	13	20	27
FRI		7	14	21	28
SAT	1	8	15	22	29

2026

September

MONSOON SEASON ISSUES REVIEW



SUN		6	13	20	27
MON		7	14	21	28
TUE	1	8	15	22	29
WED	2	9	16	23	30
THU	3	10	17	24	
FRI	4	11	18	25	
SAT	5	12	19	26	

2026 October



MONSOON SEASON ISSUES REVIEW

SUN		4	11	18	25
MON		5	12	19	26
TUE		6	13	20	27
WED		7	14	21	28
THU	1	8	15	22	29
FRI	2	9	16	23	30
SAT	3	10	17	24	31

2026 November

WINTER SEASON ISSUES REVIEW



SUN	1	8	15	22	29
MON	2	9	16	23	30
TUE	3	10	17	24	
WED	4	11	18	25	
THU	5	12	19	26	
FRI	6	13	20	27	
SAT	7	14	21	28	

2026

December



WINTER SEASON ISSUES REVIEW AND END OF YEAR
DASHBOARD DETAILING

SUN		6	13	20	27
MON		7	14	21	28
TUE	1	8	15	22	29
WED	2	9	16	23	30
THU	3	10	17	24	31
FRI	4	11	18	25	
SAT	5	12	19	26	

Road safety and Accountability Dashboard for the Year

- ☐ Certificate of Excellence YES / NO / NOT SATISFACTORY
- ☐ Traffic issues or incidences YES / NO / NOT SATISFACTORY
- ☐ Compliance with FMVSS standards YES / NO / NOT SATISFACTORY
- ☐ Onboarding of NSSR Road Safety objectives YES / NO / NOT SATISFACTORY
- ☐ Upgradability of NSSR Road Infrastructure objectives YES / NO / NOT SATISFACTORY
- ☐ Traffic Engineering Assets planning YES / NO / NOT SATISFACTORY
- ☐ Traffic Engineering Defects Liability YES / NO / NOT SATISFACTORY
- ☐ Improved on-road assistance YES / NO / NOT SATISFACTORY
- ☐ Cost of Quality /Cost of Poor-Quality Project Assistance YES / NO / NOT SATISFACTORY
- ☐ Complexity for Road Safety and Accountability YES / NO / NOT SATISFACTORY



Road safety and Accountability Dashboard for the Year/Season 1

- ☐ Certificate of Excellence YES / NO / NOT SATISFACTORY
- ☐ Traffic issues or incidences YES / NO / NOT SATISFACTORY
- ☐ Compliance with FMVSS standards YES / NO / NOT SATISFACTORY
- ☐ Onboarding of NSSR Road Safety objectives YES / NO / NOT SATISFACTORY
- ☐ Upgradability of NSSR Road Infrastructure objectives YES / NO / NOT SATISFACTORY
- ☐ Traffic Engineering Assets planning YES / NO / NOT SATISFACTORY
- ☐ Traffic Engineering Defects Liability YES / NO / NOT SATISFACTORY
- ☐ Improved on-road assistance YES / NO / NOT SATISFACTORY
- ☐ Cost of Quality /Cost of Poor-Quality Project Assistance YES / NO / NOT SATISFACTORY
- ☐ Complexity for Road Safety and Accountability YES / NO / NOT SATISFACTORY



Road safety and Accountability Dashboard for the Year/Season 2

- ☐ Certificate of Excellence YES / NO / NOT SATISFACTORY
- ☐ Traffic issues or incidences YES / NO / NOT SATISFACTORY
- ☐ Compliance with FMVSS standards YES / NO / NOT SATISFACTORY
- ☐ Onboarding of NSSR Road Safety objectives YES / NO / NOT SATISFACTORY
- ☐ Upgradability of NSSR Road Infrastructure objectives YES / NO / NOT SATISFACTORY
- ☐ Traffic Engineering Assets planning YES / NO / NOT SATISFACTORY
- ☐ Traffic Engineering Defects Liability YES / NO / NOT SATISFACTORY
- ☐ Improved on-road assistance YES / NO / NOT SATISFACTORY
- ☐ Cost of Quality /Cost of Poor-Quality Project Assistance YES / NO / NOT SATISFACTORY
- ☐ Complexity for Road Safety and Accountability YES / NO / NOT SATISFACTORY



Road safety and Accountability Dashboard for the Year/Season 3

- ☐ Certificate of Excellence YES / NO / NOT SATISFACTORY
- ☐ Traffic issues or incidences YES / NO / NOT SATISFACTORY
- ☐ Compliance with FMVSS standards YES / NO / NOT SATISFACTORY
- ☐ Onboarding of NSSR Road Safety objectives YES / NO / NOT SATISFACTORY
- ☐ Upgradability of NSSR Road Infrastructure objectives YES / NO / NOT SATISFACTORY
- ☐ Traffic Engineering Assets planning YES / NO / NOT SATISFACTORY
- ☐ Traffic Engineering Defects Liability YES / NO / NOT SATISFACTORY
- ☐ Improved on-road assistance YES / NO / NOT SATISFACTORY
- ☐ Cost of Quality /Cost of Poor-Quality Project Assistance YES / NO / NOT SATISFACTORY
- ☐ Complexity for Road Safety and Accountability YES / NO / NOT SATISFACTORY



Road safety and Accountability Dashboard for the Year/Season 4

- ☐ Certificate of Excellence YES / NO / NOT SATISFACTORY
- ☐ Traffic issues or incidences YES / NO / NOT SATISFACTORY
- ☐ Compliance with FMVSS standards YES / NO / NOT SATISFACTORY
- ☐ Onboarding of NSSR Road Safety objectives YES / NO / NOT SATISFACTORY
- ☐ Upgradability of NSSR Road Infrastructure objectives YES / NO / NOT SATISFACTORY
- ☐ Traffic Engineering Assets planning YES / NO / NOT SATISFACTORY
- ☐ Traffic Engineering Defects Liability YES / NO / NOT SATISFACTORY
- ☐ Improved on-road assistance YES / NO / NOT SATISFACTORY
- ☐ Cost of Quality /Cost of Poor-Quality Project Assistance YES / NO / NOT SATISFACTORY
- ☐ Complexity for Road Safety and Accountability YES / NO / NOT SATISFACTORY



Ease of Doing Business in 2026-2027





Quality Promotion for Road Safety/Support

REDUCING COST OF POOR QUALITY VIA NSSR SAFETY / SUPPORT PROGRAMMES



Road Safety / Support Planner (2026)



Ward(s)

- ☐ _____ Ward No
- ☐ _____ Ward No
- ☐ _____ Ward No
- ☐ _____ Ward No
- ☐ _____ Ward No

**SOCIAL
ACCOUNTABILITY**



Ward(s)

- ☐ _____ Ward No
- ☐ _____ Ward No
- ☐ _____ Ward No
- ☐ _____ Ward No
- ☐ _____ Ward No

**SOCIAL
ACCOUNTABILITY**

Help Accountability/AI/BI/CQI for

**National Safety Social Responsibility Top
10 insights for (Road) Safety
Programmes**

**National Safety Social Responsibility Top
10 insights for Co-achieving Support
Programmes**



(P-R-M) Preparedness- Readiness-and-Mitigation is
a key to Road Safety / Support management

✦	Innovation	Project Analysis to design solutions
✦	Commitment	Environmentally Conscious Practices
—	Development	Project Growth Plans
—	Implementation	Call to attention Resolution

Ask for a case study / empirical study by sending us
a message with the subject “Case study” and your
Whatsapp number

Ask for a report by sending us a message with the subject “EIA” and your Whatsapp number

Environmental Impact Assessment

Our climate change assessment services focus on evaluating the impact of different management concepts that align with sustainable development and growth objectives, ensuring long-term social wellness and environmental sustainability

NSSR (RS*) Road Safety / Road Infrastructure Support for: Year 2026-2027

NSSR (RS*) version: 1.00.2026 (WIP 2)

NSSR (RI QoS Foundation) version: 1.00.2026 (WIP 2)

NSSR (RSI and RI-QoS) Ward: _____, _____, _____, _____ and _____ Ward Nos

☐ NSSR Programme solutions: Road Safety Intelligence

☐ Summary: This Planner includes a highlight of the NSSR Programme with applicable membership details and subscription based links to URL(s) that contain upto-date information

☐ NSSR Programme solutions: Road Infrastructure Support QoS Foundation

☐ Summary: This Planner includes a highlight of the NSSR Programme with applicable membership details and subscription based links to URL(s) that contain upto-date information



NSSR Road Safety Intelligence (Selection as applicable):

- ✓ Top 10 Questions/Issues (via Bulletins)
- ☐ Baseline Solutions (via the Road Safety/Support Planner)
- ☐ Case Study Solutions (via the Road Safety/Support Planner + Case studies)
- ☐ Empirical Study Solutions (via the Road Safety/Support Planner + Empirical studies)
- ☐ Dashboard and Reports (via the Road Safety/Support Planner + Engaged Leadership and Learning)

NSSR (RI QoS Foundation) (Selection as applicable):

- ✓ Top 10 Questions/Issues (via Bulletins)
- ☐ Unique Needs Solutions / Unique Requirements Solutions (via the Road Safety/Support + Ally Planner)
- ☐ Case Study Solutions (via the Road Safety/Support + Ally Planner + Case studies)
- ☐ Empirical Study Solutions (via the Road Safety/Support + Ally Planner + Empirical studies)
- ☐ Dashboard and Reports (via the Road Safety/Support + Ally Planner + Engaged Leadership and Learning)

NSSR Membership Benefits Analysis via (Selection as applicable):

- ☐ Monthly Bulletins (Top 10 Issues and NSSR Objectives)
- ☐ Staged Analysis (via Case studies and/or Empirical Studies)
- ☐ CQI Feedback (via Logistics Assessments)
- ☐ NSSR RS* Ticketing (via the COPQ Project Centre)

NSSR Membership (Level of data analysis and reportability) (Selection as applicable):

- ✓ Top 10 Issues Guidance (via the NSSR Road Safety/Support Programme)
- ✓ NSSR Objectives Guidance (via the NSSR Road Safety/Support Planner)
- ☐ COPQ Project Centre Guidance (via NSSR Road Safety/Support Asset Development)
- ☐ COPQ Case Study / Empirical Study Guidance (via NSSR Road Safety/Support Asset Development and CS/ES)
- ☐ NSSR Road Safety Hub Guidance (via NSSR Road Safety/Support Asset Development and Road Safety Hub Assessments)

NSSR Road Safety Intelligence (Access will be enabled as applicable):

- COPQ Ward related Project Centre
- URL: Will be disclosed on subscription
- COPQ Environmental Impact Assessment Project Centre
- URL: Will be disclosed on subscription
- Road Safety Intelligence (Legacy)
- URL: <https://venkataoec.wixsite.com/driveindia>
- Road Safety Intelligence (NEXT Generation)
- URL: <https://venkataoec.wixsite.com/roadsafety-coe>



NSSR RI QoS Foundation(Access will be enabled as applicable):

- COPQ Ward related Project Centre
- URL: Will be disclosed on subscription
- COPQ Environmental Impact Assessment Project Centre
- URL: Will be disclosed on subscription
- Road Infrastructure Support (Legacy)
- URL: <https://venkataoec.wixsite.com/safercommuting>
- Road Safety Intelligence (NEXT Generation)
- URL: <https://venkataoec.wixsite.com/roadsafety-coe>



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QR code for subscription
payments

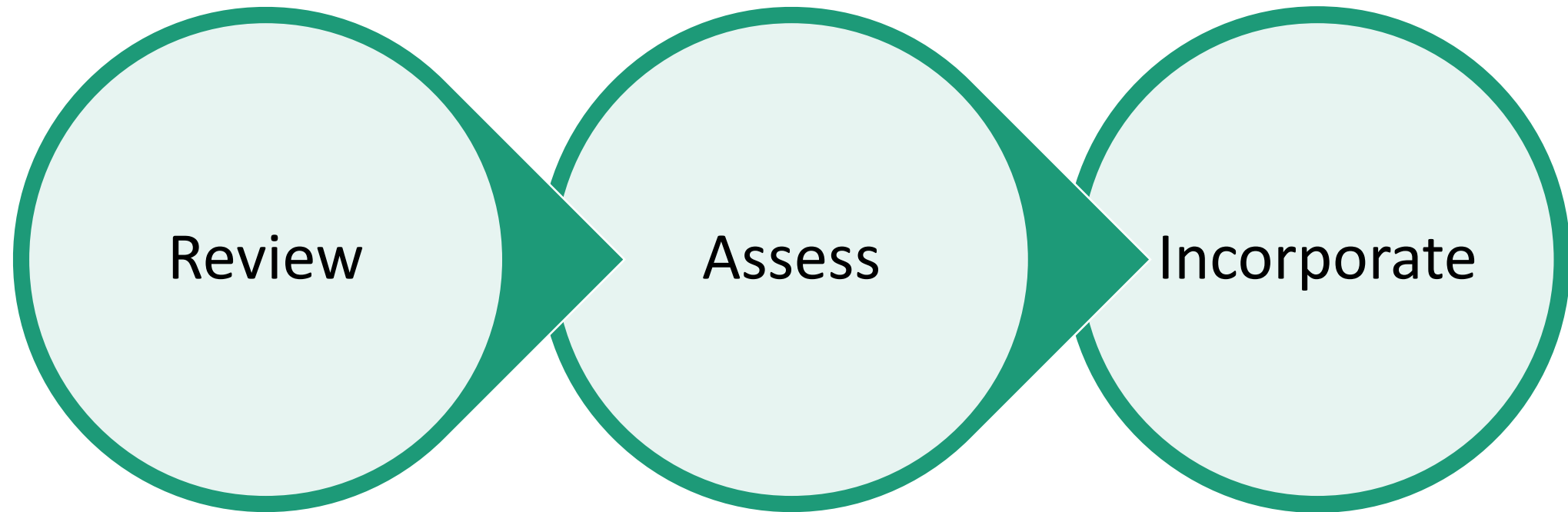
Detailed invoice for
subscription based case
studies/empirical studies
and dashboards

Vision:

Road Safety/Support
Planner

**Deliver targeted need,
analytics, reports and
case studies via a
Project Centre**

(Vision for the Road Safety/Support Planner)



NSSR ROAD SAFETY PROGRAMME (2026)

- Planner for Accountable Participation -



By our planner/programme, your organization is ready to step further for road safety. Your next steps are to – Review Line icons & actions for

Drive India NSSR-RS Unit 1 (Mandatory Traffic Signs)

TOP 10 QUESTIONS FOR ROAD SAFETY...

2W Performance Analysis, Information, Components and Systems for NSSR-RS

Drive India NSSR-RS Unit 2 (Cautionary Traffic Signs)

Centre of Excellence-integrated facility

Ease of Doing Business

Drive India NSSR-RS Unit 3 (Information/Danger/Alarm/Emergency Traffic Signs)

Risk Profile

Return of Investment Requirements

PASS-4W Performance Analysis, Information, Components and Systems for NSSR-RS

Drive India NSSR-RS Unit 4 (Drowsy Driving)

Liquidity and Income need

Drive India NSSR-RS Unit 5 (Fog or Night Driving)

Asset Plan

Drive India NSSR-RS Unit 6 (Road System Responsiveness)

Contingency Plan

CMMV Performance Analysis, Information, Components and Systems for NSSR-RS

Drive India NSSR-RS Unit 7 (Driving conditions Responsiveness)

PESTLE implications

Public Welfare / CSR

Ambulances, Air Ambulances

Drive India NSSR-RS Unit 8 (First Aid and Fire Safety Responsiveness)

Organizers:
> AOEC, Gap Analysis

Graded payload or goods movement

Drive India NSSR-RS Unit 9 (Alpha Assistance Responsiveness)

IT and non-IT
> NSC, Safety Council

Special Needs Vehicles

Drive India NSSR-RS Unit 10 (CCMA & Route Editioning)

Bengaluru Chapter

Over the air / supportive communication

LINE
ICON
GUIDANCE

DRIVER
FITNESS

VEHICLE
FITNESS

FMVS / RTO
ACTIONS

(Mission for the Road Safety/Support Planner)

Units 1 to _10__ are part of the RS* Planner as a series of exercises to sensitize, prepare, and deploy road safety practices that need to be adhered to, by a driver/commuter/ride assistance provider (as relevant for the business investor/organization)

Working through any of the Units 1 to _10__, will help the RS* Assessor to understand

- ✓ An Introduction to the unit
- ✓ The Key Learning of the unit
- ✓ The Safety Focus and Criteria of the unit
- ✓ The Hazards Analysis for the unit
- ☐ The NSSR specific Involvement for the unit (in a Case study...)
- ☐ The expected Responses reported for the unit (in a Case study...)
- ☐ The Complaints commonly reported for the unit (in a Case study...)



Table of Contents (for the RS* Assessor)

Sl No	Contents	Page No
7	Drive India NSSR-RS Unit 1 (Mandatory Traffic Signs)	WIP
8	Drive India NSSR-RS Unit 2 (Cautionary Traffic Signs)	WIP
9	Drive India NSSR-RS Unit 3 (Information/Danger/Alarm/ Emergency Traffic Signs)	WIP
10	Drive India NSSR-RS Unit 4 (Drowsy Driving)	WIP

Table of Contents (for the RS* Assessor)

Sl No	Contents	Page No
11	Drive India NSSR-RS Unit 5 (Fog or Night Driving) – Also included	WIP
12	Drive India NSSR-RS Unit 6 (Road System Responsiveness) – Also included	WIP
13	Drive India NSSR-RS Unit 7 (Driving conditions Responsiveness)	WIP
14	Drive India NSSR-RS Unit 8 (First Aid and Fire Safety Responsiveness)	WIP
15	Drive India NSSR-RS Unit 9 (Alpha Assistance Responsiveness)	WIP
16	Drive India NSSR-RS Unit 10 (CCMA & Route Editioning)	WIP

(Asset Development of the Road Safety/Support Planner)

Quality Promotion by designing a
framework to

Review

Assess

Incorporate



(Institutions/Organizations/Departments connected)

NSSR THEME QP FOR	NSSR-RS-UNIT	Nature of QP	Domains connected
INSTITUTIONAL/ ORGANIZATIONAL FITNESS	BBMP – ROAD INFRASTRUCTURE PROJECTS for the connected wards	Predictive, Survey, Feedback Sustainable Commuter Relationship with Planning and Organization	<u>NSSR-THEME-QP-Domains</u> ✓ NSC ✓ BBMP Road Infrastructure Projects ✓ BBMP Traffic Engineering ✓ BESCOM, BWSSB ✓ Healthcare Providers, Medical Supplies Providers ✓ Civic Amenity Providers ✓ Automobile Dealers ✓ Automobile Manufacturers ✓ Banking institutions ✓ Educational institutions ✓ Corporate commuters
INSTITUTIONAL/ ORGANIZATIONAL FITNESS	BBMP – TRAFFIC ENGINEERING for the connected wards	Predictive, Survey, Feedback Sustainable Commuter Relationship with Planning and Organization	
INSTITUTIONAL/ ORGANIZATIONAL FITNESS	BESCOM assistance for the connected wards	Predictive, Survey, Feedback Sustainable Consumer Relationship with Planning and Organization	
INSTITUTIONAL/ ORGANIZATIONAL FITNESS	BWSSB assistance for the connected wards	Predictive, Survey, Feedback Sustainable CSR Subscriber Relationship with Planning and Organization	

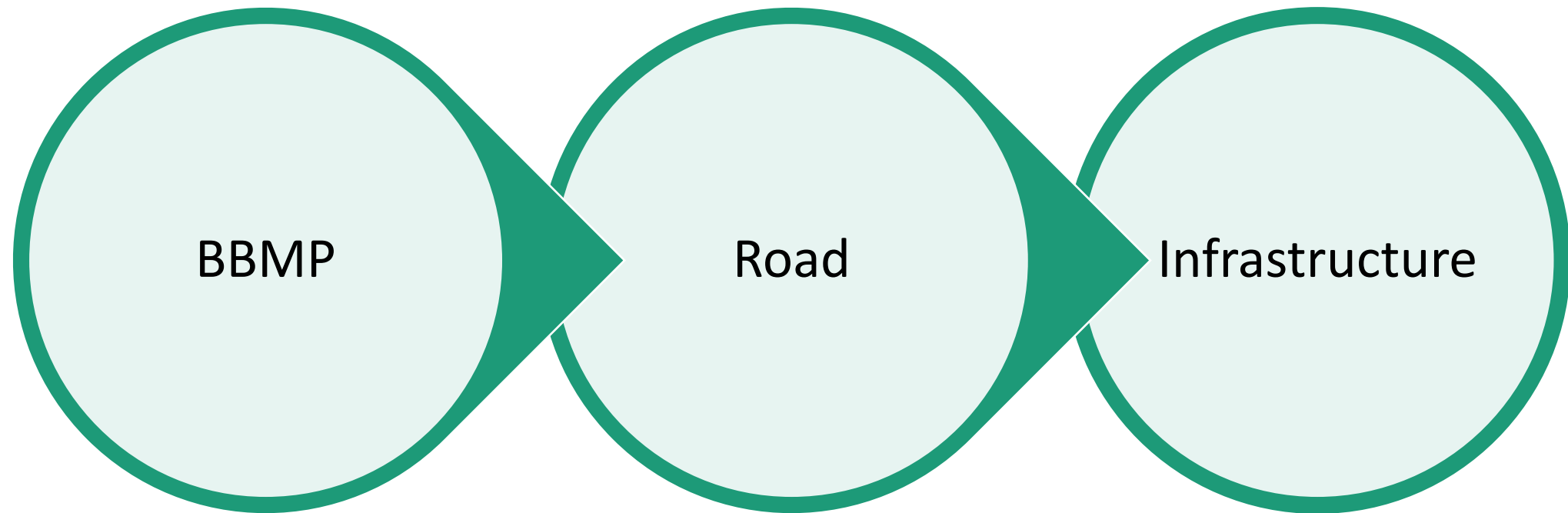
(Institutions/Organizations/Departments connected)

NSSR THEME QP FOR	NSSR-RS-UNIT	Nature of QP	Domains connected
INSTITUTIONAL/ ORGANIZATIONAL FITNESS	HEALTHCARE PROVIDERS, MEDICAL SUPPLIES PROVIDERS for the connected wards	Predictive, Survey, Feedback Sustainable Customer Relationship with Planning and Organization	<u>NSSR-THEME-QP-Domains</u> ✓ NSC ✓ BBMP Road Infrastructure Projects ✓ BBMP Traffic Engineering ✓ BESCOM, BWSSB ✓ Healthcare Providers, Medical Supplies Providers ✓ Civic Amenity Providers ✓ Automobile Dealers ✓ Automobile Manufacturers ✓ Banking institutions ✓ Educational institutions ✓ Corporate commuters
INSTITUTIONAL/ ORGANIZATIONAL FITNESS	AUTOMOBILE DEALERS, MANUFACTURERS FOR the organization's or employees vehicles and 24/7 mobility	Predictive, Survey, Feedback Sustainable Customer Relationship with Planning and Organization	
INSTITUTIONAL/ ORGANIZATIONAL FITNESS	EDUCATIONAL INSTITUTIONS in the connected wards	Predictive, Survey, Feedback Sustainable Commuter Relationship with Planning and Organization	
INSTITUTIONAL/ ORGANIZATIONAL FITNESS	BANKING INSTITUTIONS in the connected wards	Predictive, Survey, Feedback Sustainable Customer Relationship with Planning and Organization	

(Institutions/Organizations/Departments connected)

NSSR THEME QP FOR	NSSR-RS-UNIT	Nature of QP	Domains connected
INSTITUTIONAL/ ORGANIZATIONAL FITNESS	CORPORATE COMMUTERS in the connected wards	Predictive, Survey, Feedback Sustainable Customer Relationship with Planning and Organization	<u>NSSR-THEME-QP-Domains</u> ✓ NSC ✓ BBMP Road Infrastructure Projects ✓ BBMP Traffic Engineering ✓ BESCOM, BWSSB ✓ Healthcare Providers, Medical Supplies Providers ✓ Civic Amenity Providers ✓ Automobile Dealers ✓ Automobile Manufacturers ✓ Banking institutions ✓ Educational institutions ✓ Corporate commuters ✓ Mission critical parts manufacturers
INSTITUTIONAL/ ORGANIZATIONAL FITNESS	CIVIC AMENITY PROVIDERS for the connected wards	Predictive, Survey, Feedback Sustainable Customer Relationship with Planning and Organization	
INSTITUTIONAL/ ORGANIZATIONAL FITNESS	ROUTE EDITIONING AND FAST TRACK PRM FRAMEWORKS for the connected wards PRM stands for Preparedness, Responsiveness and Mitigation of road system dynamics	Predictive, Survey, Feedback Sustainable Customer Relationship with Planning and Organization	
			45

(Quality promotion ? or Asset Development ? For the Institutions/ Organizations/Departments connected)

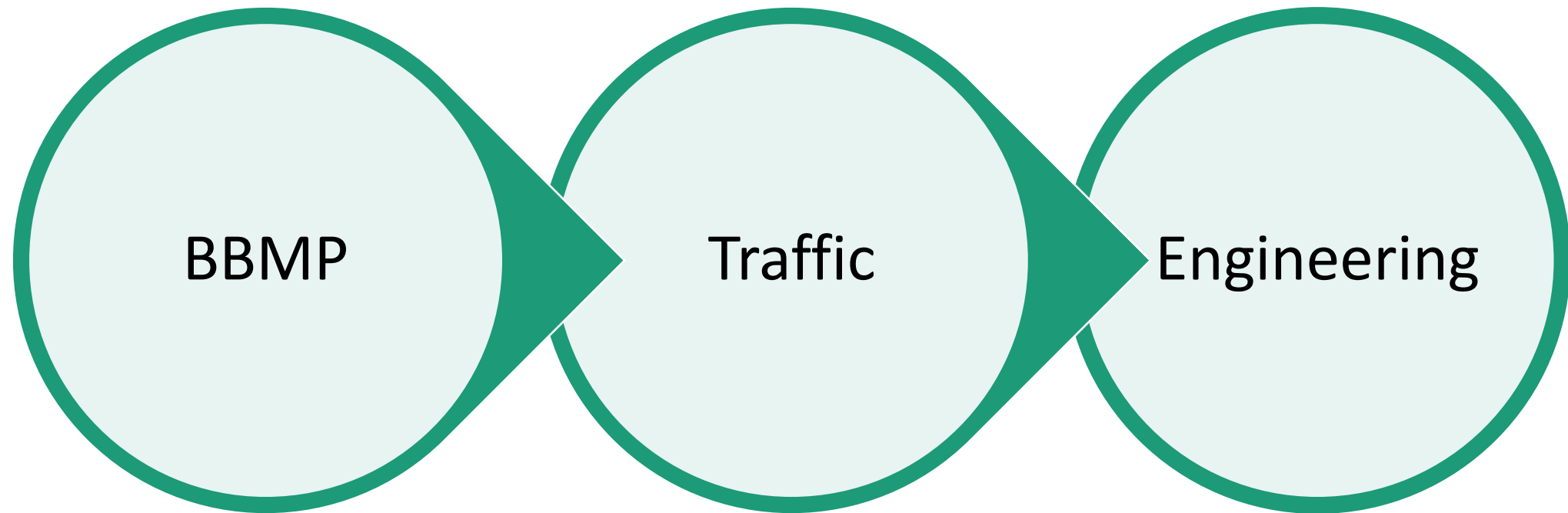


Primary Work Areas for BBMP RI Projects



Sl No	Nature of work	Applicable for NSSR Theme
1	Major Road Systems Planning and Projectization	Yes
2	Road construction and widening	Yes
3	Road Maintenance	Yes
4	Drainage improvement	Yes
5	Road Safety Measures like installing humps, medians, junctions for reducing speed	Yes
6	Pedestrian Safety Measures like footpaths, pedestrian crossings, skywalks	Yes
7	Judicious involvement with the Bangalore Development Authority (BDA) and Agenda for Bengaluru Infrastructure Development Task Force (ABIDe)	GOK-WIP
8	Recommended – Projectization for Event Wheel Incorporation in road system planning and organization which focuses on evaluating and responding to QOI, QOP, QOS, QOO issues for, Key opinion Intelligence and Pincode Intelligence for NSSR Themes	Yes, WIP

(Quality promotion ? or Asset Development ? For the Institutions/ Organizations/Departments connected)



Primary Work Areas for BBMP Traffic Engineering



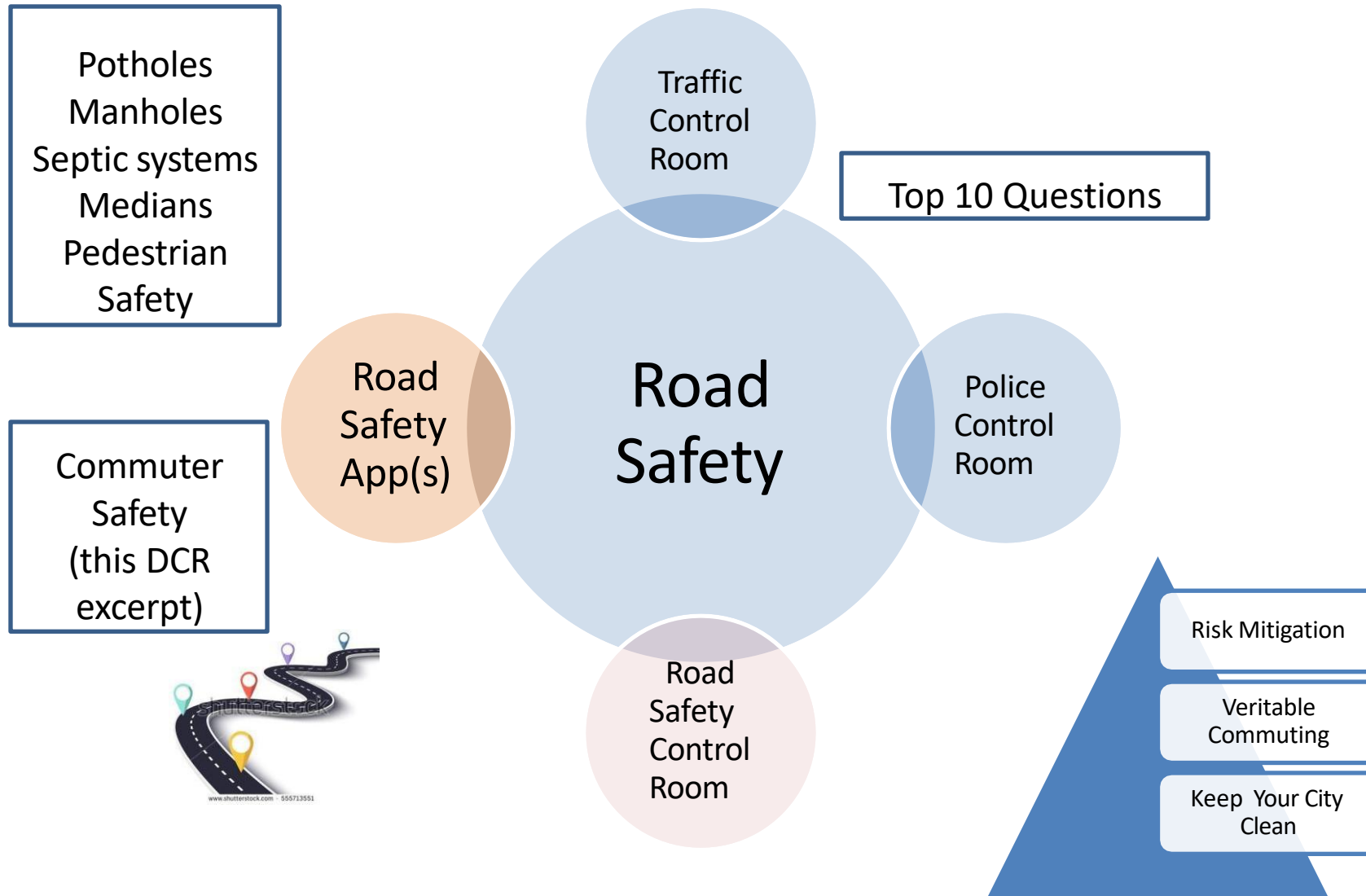
Sl No	Nature of work	Applicable for NSSR Theme
1	Road development and maintenance effectiveness of arterial and sub-arterial roads	Yes
2	Junction improvement for optimizing traffic flow via signal management and road design indicators	Yes
3	Bus Bays and Shelters construction and maintenance	Yes
4	Traffic flow streamlining or calming through installation of humps, medians, junctions	Yes
5	Responsiveness for Street network design to incorporate provisions for pedestrians, cyclists and amenity providers	Yes
6	Responsiveness for Pedestrian Safety Measures like footpaths, pedestrian crossings, skywalks	Yes
7	Public Transport Enhancement	Yes
8	Freight Movement Planning, Interrelating effectiveness and Supported with new idea Freight corridors and Logistics hubs foundations	Yes
8	Road cutting, Duct Management, Tree cutting, and landscaping	Yes

Primary Work Areas for BBMP Traffic Engineering

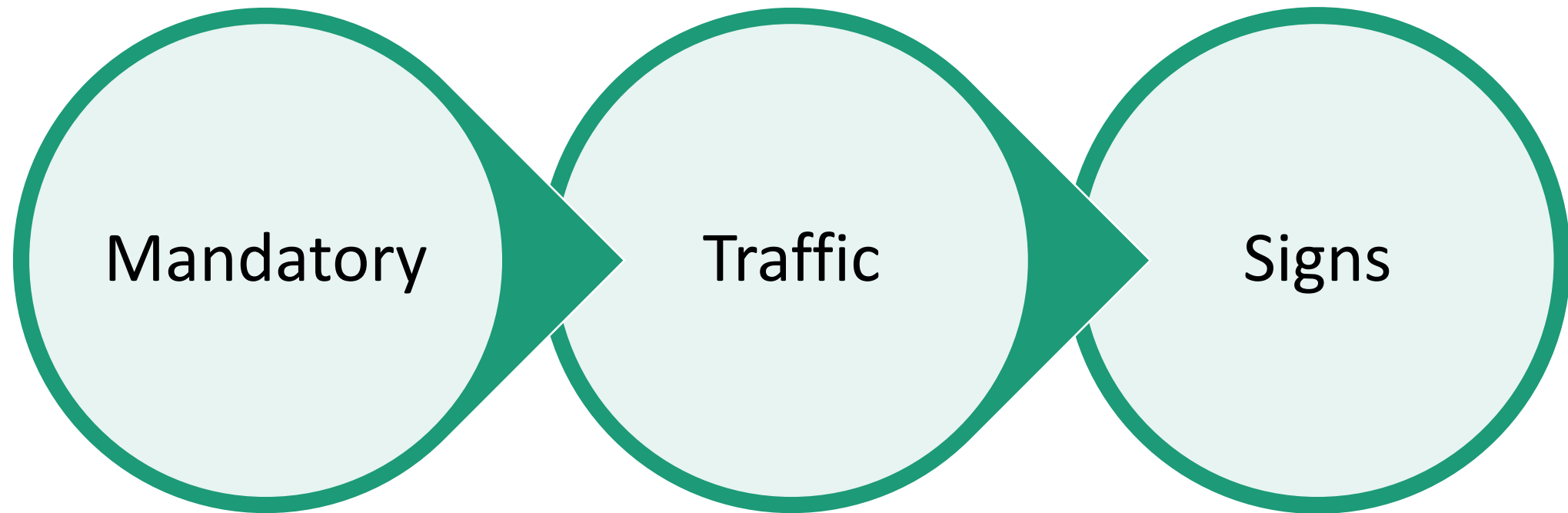


SI No	Nature of work	Applicable for NSSR Theme
10	Projectization for Analytics for QOI, QOP, QOS and QOO in traffic engineering, planning and organization with an Event Wheel for incorporating Key Opinion Intelligence (KOI), Pincode Intelligence and TMS Route Assurance	Yes, WIP
11	Design and develop a Traffic Engineering Studio with editioning of tiered responsiveness for (a) TE Attributes and Touch points with changing velocity and likelihood (b) TE related value delivery (c) TE problem solving for Ranked environments and landscapes (d) TE Viewpoint synergy, Where the Viewpoint for traffic engineering can be ☐ Profile information ☐ Regular Need/Concern/Complaint/Feedback based information ☐ Image attached Need/Concern/Complaint/Feedback based information ☐ Audio stream attached Need/Concern/Complaint/Feedback based information ☐ Audio/Video stream attached Need/Concern/Complaint/Feedback based information ☐ Advanced-focus or Perspective imagery attached Need/Concern/Complaint/Feedback based information	Yes, WIP

Road Safety/Support Planner



(Road Safety/Support Planner)



Mandatory traffic signs



STOP



GIVE WAY



ONE WAY



NO ENTRY



ONE WAY



NO WAY
BOTH DIRECTION



RIGHT TURN
PROHIBITED



LEFT TURN
PROHIBITED



U-TURN
PROHIBITED



OVER TAKING
PROHIBITED



HORNS
PROHIBITED



SPEED
LIMIT



COMPULSORY
TURN LEFT



COMPULSORY
AHEAD ONLY



COMPULSORY
TURN RIGHT AHEAD



COMPULSORY AHEAD
OR TURN RIGHT



COMPULSORY AHEAD
OR TURN LEFT

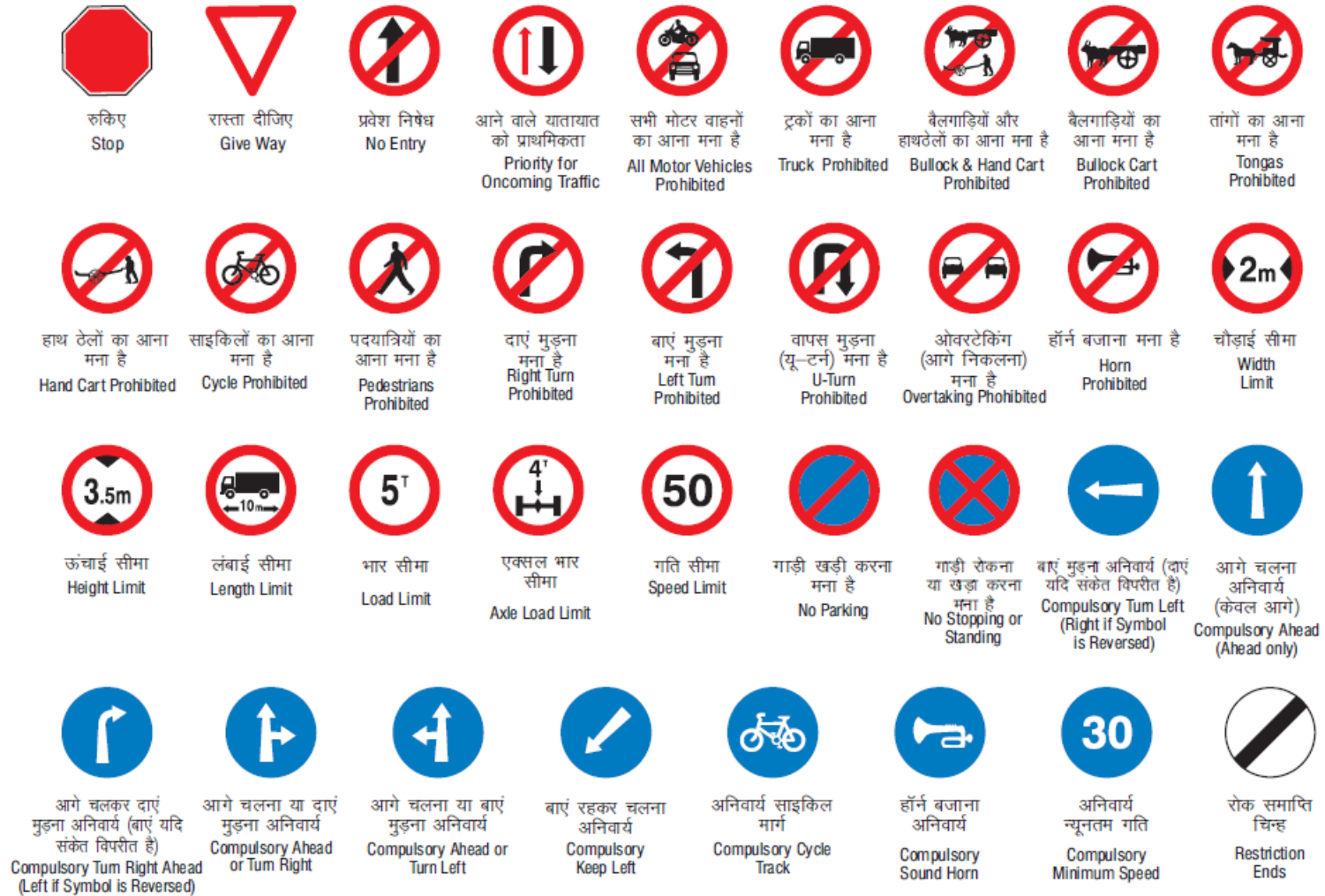


COMPULSORY
KEEP LEFT

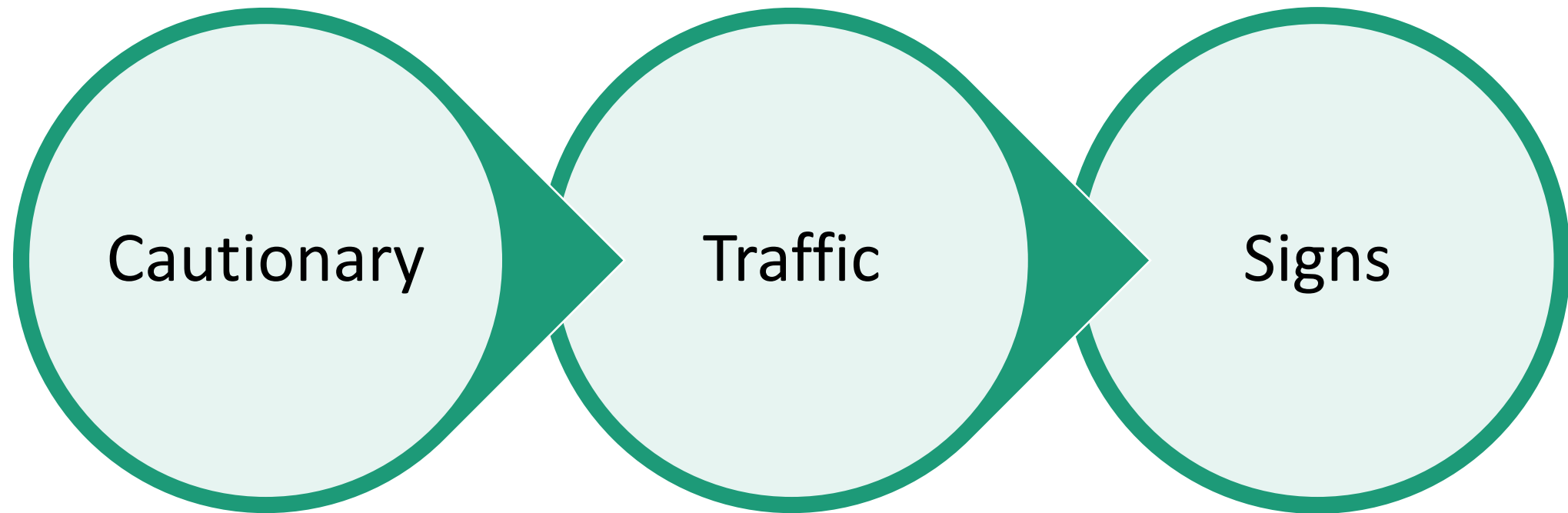


COMPULSORY
SOUND HORN

Most observed Mandatory Traffic Signs



(Road Safety/Support Planner)



Cautionary traffic signs

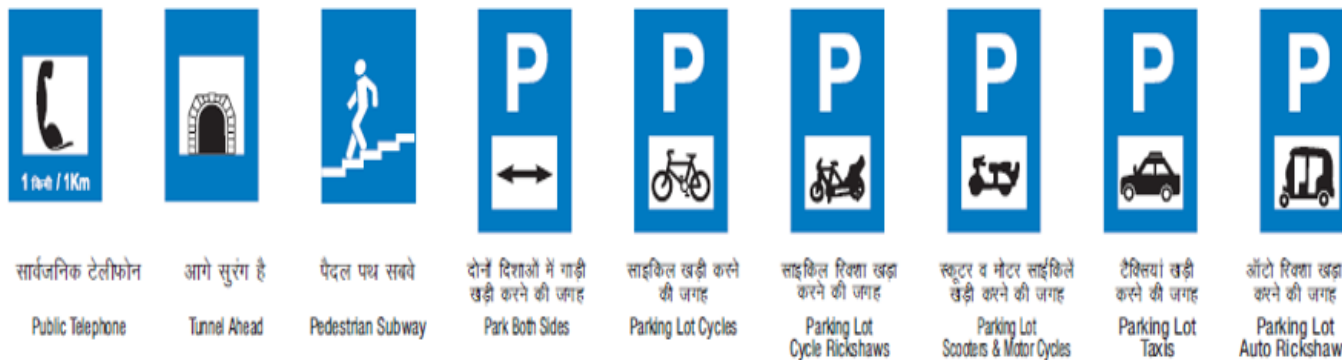
				
Right Hand Curve	Left Hand Curve	Right Hair Pin Bend	Left Hair Pin Bend	Right Reverse Bend
				
Left Reverse Bend	Steep Ascent	Steep Descent	Narrow Road Ahead	Road Wideness Ahead
				
Narrow Bridge	Slippery Road	Loose Gravel	Cycle Crossing	Pedestrian Crossing
				
School Ahead	Men at Work	Cattle	Falling Rocks	Ferry

Most observed Cautionary Traffic Signs



(Road Safety/Support Planner)

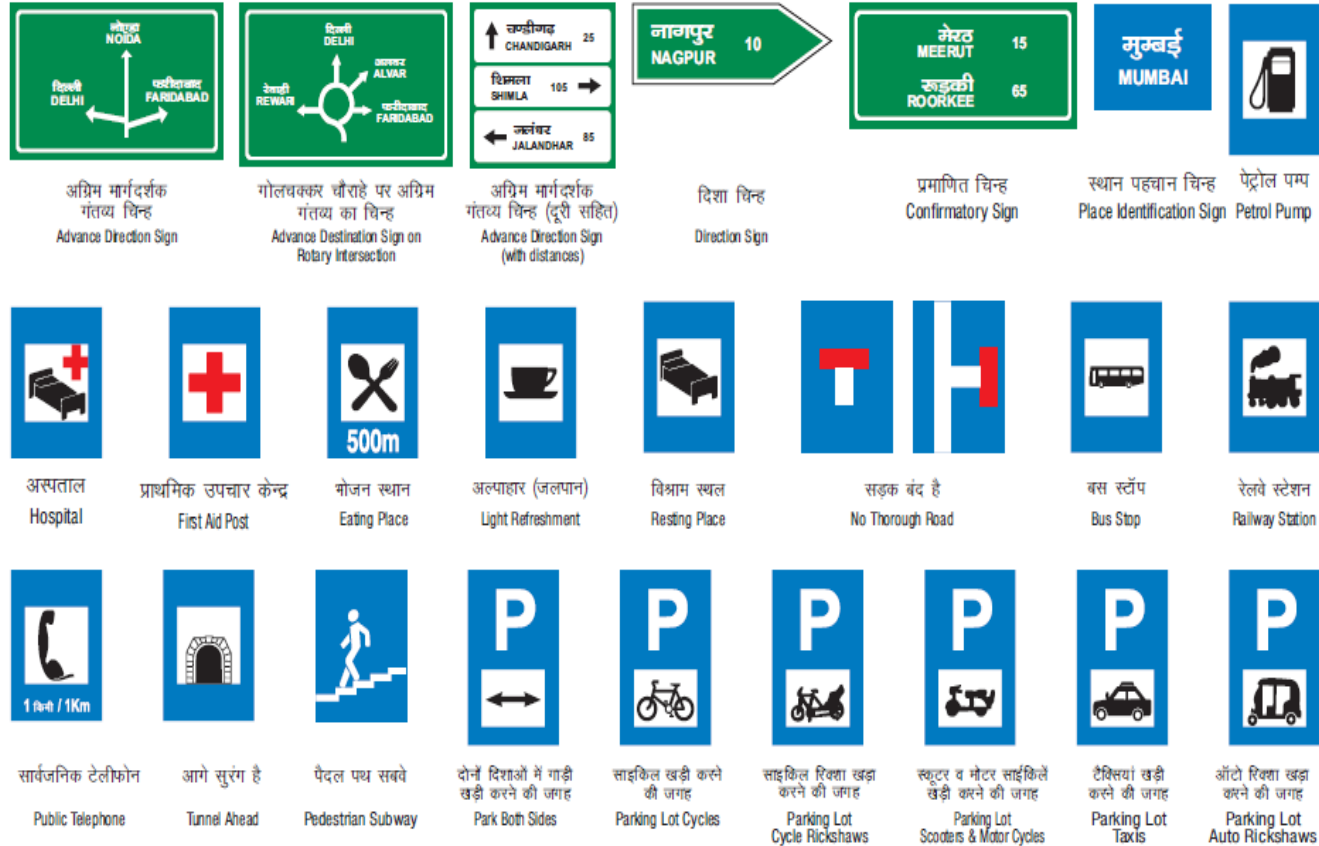




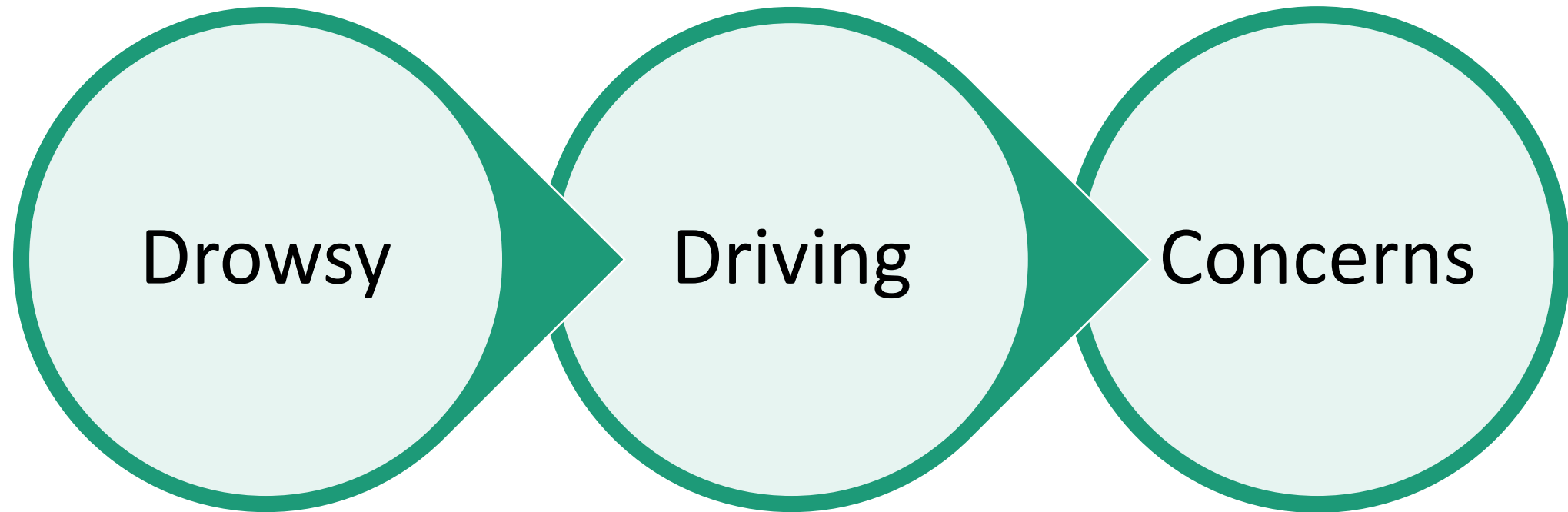
Valuable examples of Civic Amenities

- ☐ Traffic Control / Traffic Police Stations
- ☐ Pedestrian Subway/ Subway
- ☐ Railway Station
- ☐ Metro lanes / Tram track
- ☐ Bus stop
- ☐ First aid and Ambulance Post
- ☐ Hospital
- ☐ Connected Socio-Economic-Need and Incidence mitigation facilities
- ☐ Connected Vehicle Maintenance & Repair Facilities
- ☐ Connected Vehicle Spare parts suppliers
- ☐ Connected Cluster of suppliers
- ☐ Connected Power and Electricity management / Water supply/ Sanitation
- ☐ Connected Lean Waste management
- ☐ Place identification sign, Confirmatory sign
- ☐ Direction sign, Advance Direction sign

Most observed Information Signs



(Road Safety/Support Planner)



DRIVER FITNESS NOTIFIER

This journey needs awareness of the following warning signs for drowsy driving

- ☐ Yawning
- ☐ Inability to keep eyes open
- ☐ Talking incoherently or inability to respond to questions from passengers or co-drivers
- ☐ “Nodding off” and trouble keeping your head up
- ☐ Inability to remember driving the last few miles
- ☐ Ending up too close to nearby cars
- ☐ Missing road signs or turns
- ☐ Drifting into other lanes or onto rumble strips on the shoulder

DRIVER FITNESS NOTIFIER

This journey needs awareness of norms for night/drowsy driving

- ☐ Get a full night of seven to eight hours of sleep before long journeys or when you must undertake driving
- ☐ Avoid driving late at night or at times you are known to feel sleepy
- ☐ Avoid driving alone when you feel you are most vulnerable
- ☐ On a long trip, share the driving with another co-driver
- ☐ Rolling down the windows or turning up the volume on the radio will not always increase alertness while driving.
- ☐ Pull over at a suitable rest stop and take a nap
- ☐ Use hot caffeine or tea for a short-term boost. Take a short nap after consuming caffeine or tea to maximize the effect
- ☐ For office goers, arrange for someone you know or service you can trust to give you a ride home after working a late shift
- ☐ Blink and record eyeball response using a mobile camera and run a test to check alertness levels
- ☐ This eyeball response test may be scientifically and innovatively interesting for the manufacturer network involved in the making and utilizing of branded public transport vehicles and goods transport vehicles.

(Road Safety/Support Planner)

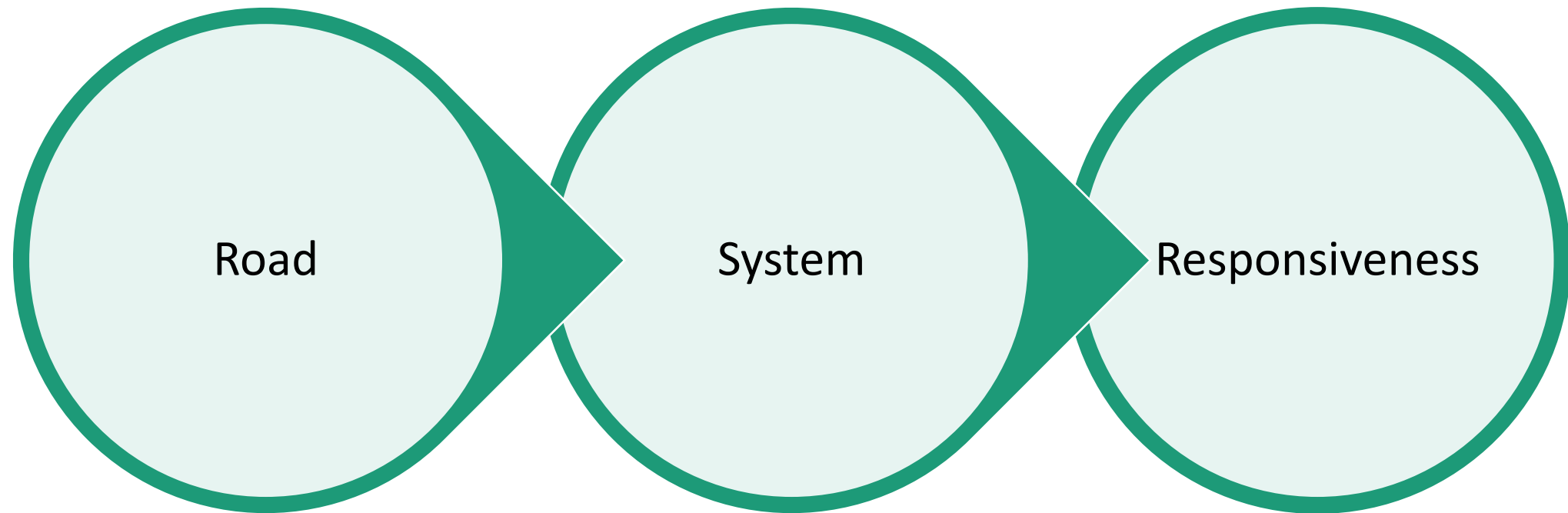


DRIVER FITNESS NOTIFIER

This journey needs awareness of the guidelines for fog afflicted driving

- Visibility:** Use low-beam headlights, as high beams can reflect off the fog and worsen visibility.
 - Speed:** Reduce your speed and increase your following distance to have more time to react to changing conditions.
 - Distractions:** Avoid distractions like cell phones or music, and keep your windows and mirrors clean.
 - Avoidance:** Do not overtake other vehicles, and avoid sudden braking or maneuvers.
 - Visibility:** Ensure your tail lights and blinkers are working and visible.
 - Fog Lights:** If your car has fog lights, use them to improve visibility.
 - Windshield:** Use warm air conditioning to clear any mist on your windshield.
 - Horn:** Blow your horn repeatedly, especially when changing lanes or approaching turns.
 - Pull Over:** If visibility is extremely poor, pull over to a safe location and wait for conditions to improve.
-

(Road Safety/Support Planner)



DRIVER FITNESS NOTIFIER

The acknowledgement of driver fitness can be done via the planner.

What are the hazardous factors for the road system (where the applicability differs)?

There are many different factors such as

1. Sudden bends or curves where it is not possible to ensure clear visibility
2. Needing immediate repair roads/tracks with or without signs
3. Sudden vehicle/vehicles stopping with or without signs
4. Sudden crossings with or without signs
5. Sudden Speed regulators with or without signs
6. Sudden Medians or missing Barricades with or without signs
7. Unexpected road/track surface deterioration

DRIVER FITNESS NOTIFIER

What are the hazardous factors for the road system (where the applicability differs)?

8. Poorly maintained septic systems

9. Driving guidelines or rules violators and lack of driving norms

10. Road System Hotspots

11. Lack of self-assessments of driver fitness with guidance

12. Lack of feedback systems that alert or mitigate risks and hazards

13. Controlling of undue deviations in driving or undue colliding

14. Google Map inconsistencies for real world road systems.

15. Google Map's limited awareness of road fitness or relevance for the road system and any in location codification etc.

DRIVER FITNESS NOTIFIER

Continual undertaking for driving (Tick as applicable)

- ☐ I am not under the influence of alcohol & will not consume any while driving
- ☐ I am not under the influence of drugs & will not use any while driving
- ☐ I am as deemed physically fit to drive
- ☐ I am as deemed mentally fit to drive
- ☐ I will adhere to the rule of fastening seatbelts
- ☐ I will adhere to the rule of wearing protective headgear (2W driver & co-driver)
- ☐ I am driving a vehicle of permissible weight (as mentioned in the license/cleared to race assessment)
- ☐ I am aware and will comply with the duty of the driver to stop or remain stationery (when required to do so by a race/rally officer in uniform, an alarmed driver/co-driver or unmanageable vehicle, or when there is an accident)
- ☐ I am aware and will comply with the duty of the driver in case of an accident and injury to a person/person(s) (exceptions only as mentioned in the rules and regulations for the commuters of a road system/route)

Road System responsiveness

This journey needs awareness of the following road system risks

(S) Controlling issues of commuter safety

1. Sudden bends or curves with or without signs, where it is not possible to ensure clear visibility
2. Under repair roads with or without signs
3. Sudden Traffic signals with or without signs
4. Sudden Culverts and Pedestrian crossings with or without signs
5. Sudden Speed breakers with or without signs
6. Sudden descent or ascent with or without effective Vehicle movement signs
7. Lack of SMART Vision enabling signages / exhibits



SMART Vision

Road System responsiveness

This journey needs awareness of the following road system risks

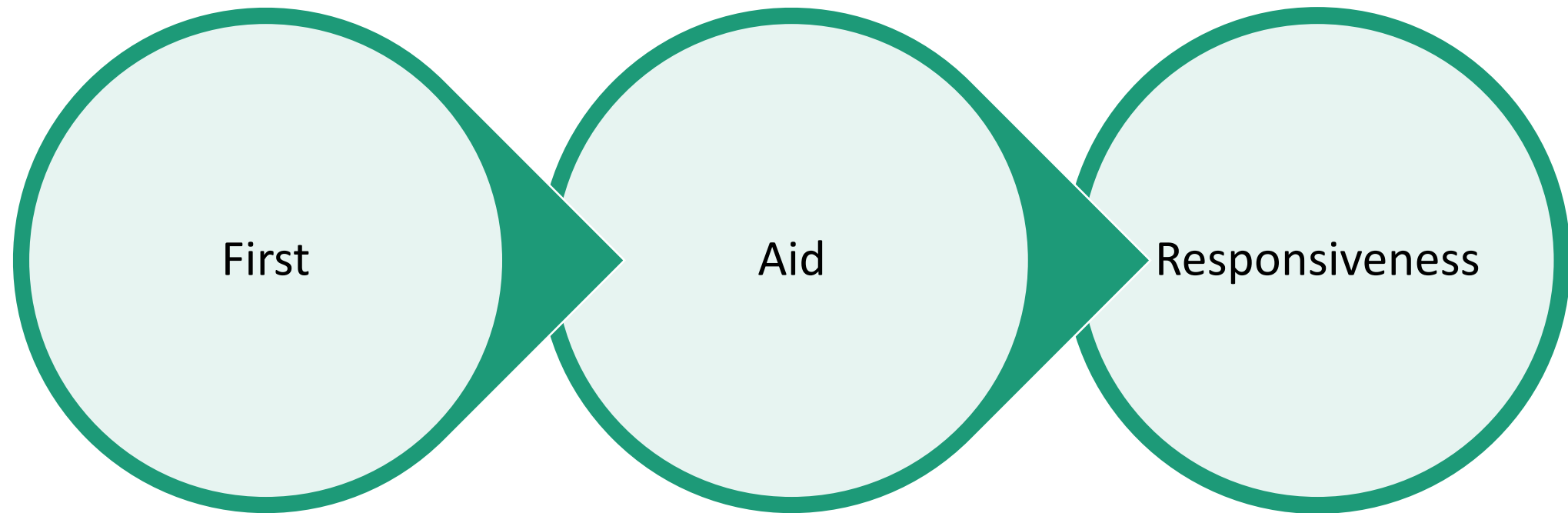
(A) Addressing Road Infrastructure

1. Unmanned Road Medians or missing Bordering Road Barricades with or without signs
2. Road deterioration and potholes
3. Poorly maintained septic systems and manholes
4. Traffic violators and lack of driving norms (where all this highlight the need for driver fitness)
5. Unplanned road-to-road systems with no clear visibility
6. Unplanned tree cover sidelining the road system
7. Unmitigated tree fall / branch collapse for the road system
8. Weather forecast related tree fall / branch collapse for the road system



SMART Vision

(Road Safety/Support Planner)





Guided Vital Health Contingency Plan Assistant

Healthcare group for quality of life: Educated family/Partially Educated family/Uneducated family/Other requirements

Weight: Normal/Under-weight/Overweight/Needs monitoring/Do not know

Blood picture diagnostics: Normal/Susceptible/Needs monitoring/Do not know

Blood sugar diagnostics: Normal/Low/High/Needs monitoring/Do not know

Blood pressure diagnostics: Normal/Low/High/Needs monitoring/Do not know

Cardio-vascular function diagnostics: Normal/Diagnosis available/Susceptible/Needs monitoring/Do not know

Liver function diagnostics: Normal/Diagnosis available/Susceptible/Needs monitoring/Do not know

Renal function diagnostics: Normal/Diagnosis available/Susceptible/Needs monitoring/Do not know

DNA/RNA (mutation) diagnostics: Normal/Diagnosis available/Needs monitoring/Do not know

Auto-immune system diagnostics: Normal/Diagnosis available/Needs monitoring/Do not know

Recording details of any specific Emergency Response Healthcare provider to call



Contingency Plan Assistant

While on-road, do you know what to do for

- ☐ Heart Attack symptoms
- ☐ Blood sugar level changes
- ☐ Blood pressure level changes
- ☐ Cuts/Wounds (severe)
- ☐ Burns
- ☐ Fractures
- ☐ Respiratory problems
- ☐ Allergic reactions
- ☐ Climate related illnesses
- ☐ Alpha Assistance for afflicted or impaired co-passengers



Recording details of any Emergency Response Healthcare Provider to call



Contingency Plan Assistant

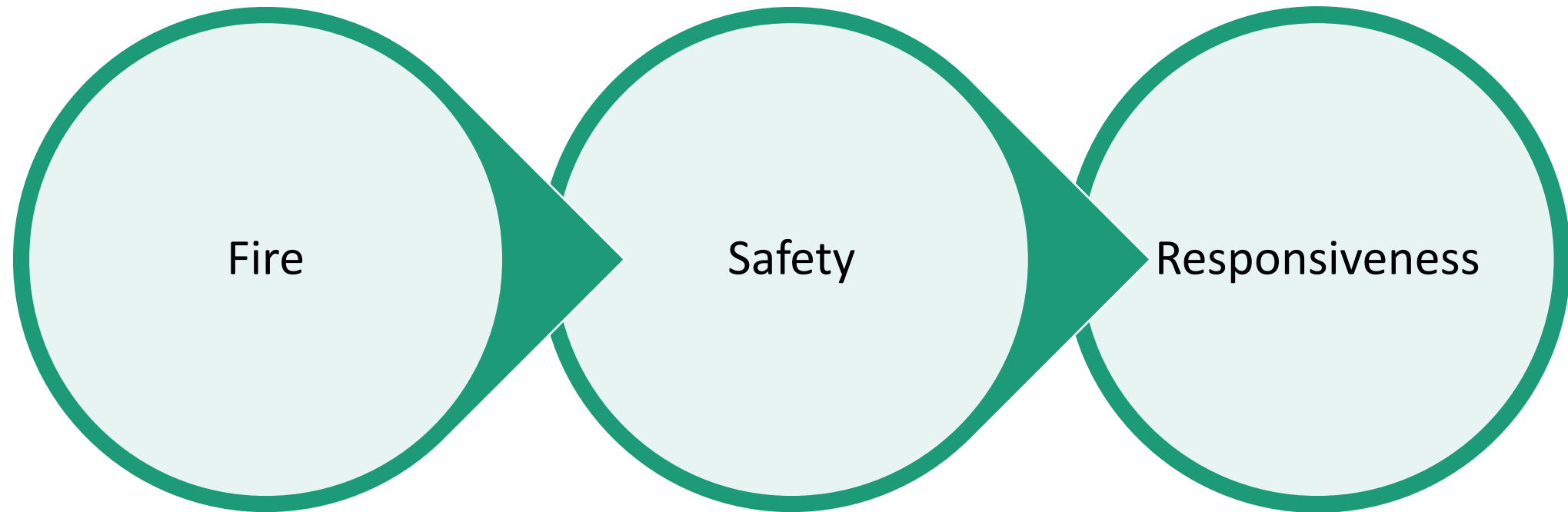
When on-road or in long distances, do you know what to do for

- ☐ Snake bites
- ☐ Electric shocks
- ☐ Bites
- ☐ Stings
- ☐ Fires
- ☐ Heat waves
- ☐ Cold waves
- ☐ Severe concern for the afflicted co-passengers
- ☐ Alpha Assistance in Emergencies
- ☐ Alpha Assistance in Vehicle Breakdowns
- ☐ Alpha Assistance in Due Relief measures



Recording details of any Emergency Response
Healthcare Provider to call

(Road Safety/Support Planner)



Assisting Primary Work Areas for the KSFES

 ROAD SAFETY - OUR
NATIONAL SAFETY
AND SOCIAL
RESPONSIBILITY

SI No	Nature of work	Applicable for NSSR Theme
1	The Karnataka State Fire and Emergency Services (KSFES) primarily focuses on firefighting, rescue operations, and disaster management. This includes saving lives and property from fires and other emergencies, conducting search and rescue operations, providing advice on fire safety, and enforcing fire safety measures in hazardous areas. They also play a crucial role in public awareness campaigns regarding fire prevention and safety.	TBD
2	Fire fighting	Yes
3	Rescue operations	Yes
4	Disaster Management	Yes
5	Fire Safety Advice and Enforcement	Yes
6	Public Awareness	NA
7	Emergency Response	Yes

Assisting Primary Work Areas for the KSFES



SI No	Nature of work	Applicable for NSSR Theme
8	Training	TBD
9	Fire Warden Program	Yes
10	Emergency Medical Services	Yes
11 (IN-WIP-STATUS)	Universal planning for improved FESA (Fire Emergency Services and Safety Actuation)	Yes
12 (IN-WIP-STATUS)	Universal planning for NSSR (National Safety Social Responsibility) Theme incorporation	Yes

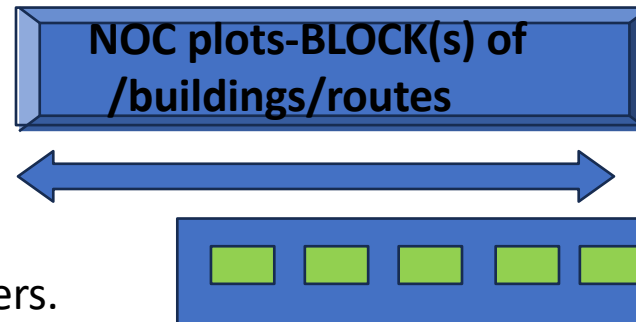
About the KSFES organizational flow

- KSFES Operational flow of command/rescue services
 - From the operational point of view, the Bengaluru City has been given under the control of two Chief Fire Officers i.e
 - Chief Fire Officer, Bengaluru East and
 - Chief Fire Officer, Bengaluru West.
 - Bengaluru City is further divided in to 4 Regions with a specially assigned Regional Fire Officer:
 - 1.Bengaluru-East Range
 - 2.Bengaluru-West Range,
 - 3.Bengaluru-North Range and
 - 4.Bengaluru-South Range.
 - Under each Regional Fire Officer, 2-3 District Fire Officers function.
 - These District Fire Officers are the drawing and disbursing officers of respective districts.

KSFES inspects or assesses buildings & plots and issues then a NOC if their construction and in-situ environment adheres to regulations and defined guidelines

About the KSFES organizational flow

- KSFES Operational flow of command/rescue services
- From the operational point of view, the District Fire Officers are also supervisory officers of the fire stations, falling under their jurisdiction.
- Under each District Fire Officer, 3-4 Fire Station Officers are known to be working.
- Fire Station Officers are the unit officers, known to be directly looking after a Fire Station.
- The Fire Station Officers are assisted by Assistant Fire Station Officers.
- Each Fire Station has
 - Leading Firemen,
 - Driver Mechanics,
 - Fireman Drivers and
 - Firemen who are the first responders.



KSFES expects
Technical
Persons to
register and
submit details
for any NOC of a
building or plot

Technical
Persons can
include

- ❑ Architect
- ❑ Structural Engineer
- ❑ Electrical Engineer
- ❑ PH Engineer
- ❑ Site Supervisor
- ❑ Civil Engineer
- ❑ Contractor

Valuable Quality Promotion for Fire Safety responsiveness

This begins with questions like – help the KSFES or coordinating departments survey the need for responsive, relevant, safe, agile, supportive, strategic and sustainable FESA initiatives, proposals and programmes with

1. A Strategic alignment for social responsibility themes or NSSR themes like road safety guidance, Civic Amenity requirements, RADIUS of Coverage for critical services etc
2. A Culture of Quality promotion , continual quality improvement for proven granularity, accountability and transformability at the macro and micro level via the use of relevant 4P(s) and 6M(s)
3. This Strategic alignment relates to the improving of guidelines or standards like SERVQUAL, ISO 9004, Agile Management Methodology and editioning of NOC/NSSR Theme handbooks for quality,, safety, social responsibility and sustainable relationship management.
4. FESA stands for: Fire and Emergency Services Actuation

Understanding of responsiveness / accountability

Understanding of responsiveness / accountability in FESA

- Fire and Emergency Services Actuation is a multi-factored concept that encompasses various aspects of planning, and organizing for mission critical and accountable service delivery, including reliability, responsiveness, agile management methodology assurance, empathy, and tangible FESA elements. These dimensions contribute to the KSFES endeavor and success.
- Key Dimensions of KSFES's FESA Quality with 4P(s) and 6M(s):
- **Reliability for SCRPO (Sustainable Clustered-Pincode Relationship Planning & Organization):**
 - The ability of KSFES to perform the promised service accurately and on time.
- **Responsiveness for SCRPO:**
 - The awareness-preparedness-readiness of KSFES to help people and provide prompt service.
- **Assurance for SCRPO:**
 - The knowledge, courtesy, and ability of KSFES to inspire trust and confidence in people.
- **Empathy for SCRPO:**
 - The caring and 4P(s) attention that the SFES provides to people.
- **Tangibles for SCRPO:**
 - The quality and reliability of KSFES's facilities, vehicles. equipment, and the 6M(s) framework.
 - KSFES's 4P(s) interrelated ease to respond to travel, evaluate, assist, mitigate or avail of landscape-density based FESA services.

4P(s)

Pincode

Provisioning

Place

Programmability

6M(s) like Manpower,
Methods, Measurements,
Metrics, Machines, Money for
SCRPO

Understanding of the need or incidental need

Understanding of the need for fire and emergency services

- ✓ Urbanization / Target population
 - ✓ Demography
 - ✓ Landscape density
 - ✓ FESA trends
 - ✓ FESA satisfiers
 - ✓ FESA assistance for Health and Safety
 - ✓ Emerging Climate change issues or incidental interest in FESA
 - ✓ Processes and Procedures
 - ✓ KSFES's/ Clustered Pincode readiness to adapt, and adopt
- SCRPO* recommendations, guidelines and regulations. AOEC does provide more details for proactive SCRPO if this is of interest.

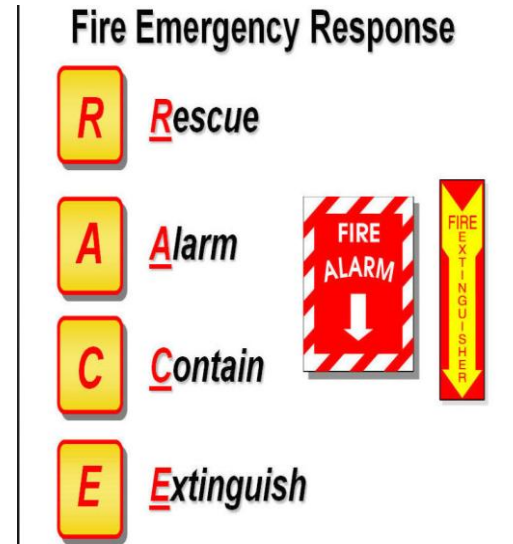
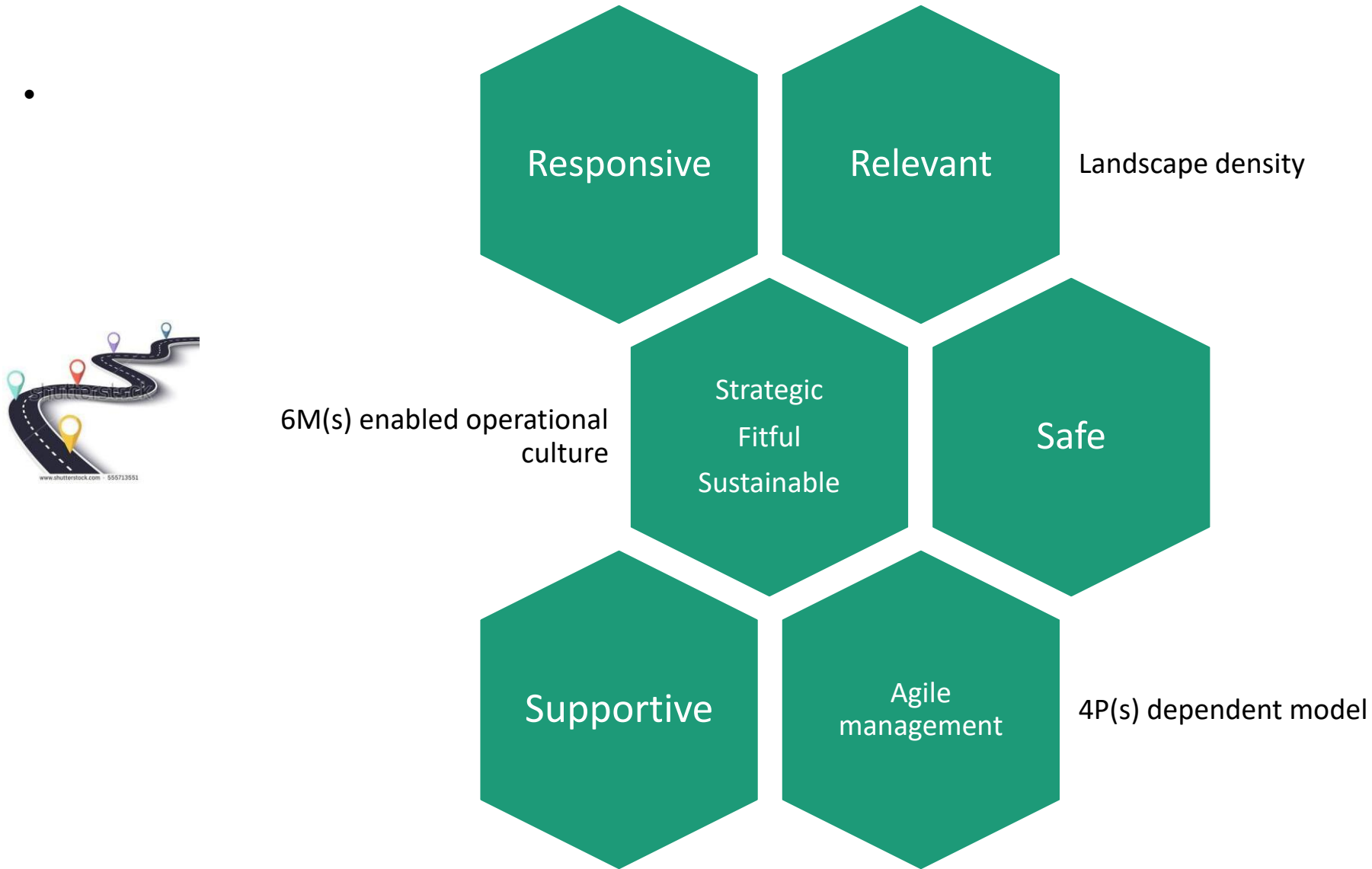
Importance of Service Quality

- ☐ Landscape density Advantage
- ☐ NSSR Theme Performance
- ☐ Clustered Pincode Relationship Planning and Organization
- ☐ Clustered Pincode Performance
- ☐ Clustered Pincode Guidance/NOC

Measuring Service Quality

- ☐ SERVQUAL/ISO 9004
- ☐ More to Care Analysis (M2CA)
- ☐ Clustered Pincode Performance Surveys
- ☐ SCRPO Surveys
- ☐ Clustered Pincode Guidance/NOC

Understanding of Clustered Pincode Performance



Drive India NSSR-RS Unit 8 (Fire Safety responsiveness)

The expected Responses reported for the unit and it's enabling of road safety

Added notes:

Fire safety risk assessment: 5-step checklist (accessible)

- Fire hazards.
- People at risk.
- Evaluate and act.
- Record, plan and train.
- Review.

What is the basic principle of fire safety?

Identifying and eliminating potential sources of ignition is crucial in preventing fires.

Common sources include faulty electrical wiring, open flames, or overheated machinery.

Ensuring proper maintenance and inspection can significantly reduce these risks.

Important Considerations:

•Fuel System Leaks:

•Leaks in the fuel system are a common cause of vehicle fires, so it's crucial to address them quickly.

•Time is of the Essence:

•Prompt action is essential for both drivers and first responders to minimize the damage and risks associated with vehicle fires.

Drive India NSSR-RS Unit 8 (Fire Safety responsiveness)

The expected Responses reported for the unit and it's enabling of road safety

Added notes:

On-road responsiveness to vehicle fires involves immediate actions like stopping safely, turning off the engine, and calling for help.

Firefighters prioritize blocking and safe vehicle positioning to ensure their safety and effective fire suppression. Knowing your vehicle's bonnet catch location and how to use an extinguisher can be crucial for tackling a small engine fire.

Drive India NSSR-RS Unit 8 (Fire Safety responsiveness)

The expected Responses reported for the unit and it's enabling of road safety

Added notes:

For Drivers:

1. **Safety First:** Pull over to a safe location, away from traffic, and turn off the engine.
2. **Call for Help:** Immediately contact emergency services to report the fire.
3. **If a small engine fire:** Know where your bonnet catch is, and if it's safe to lift the bonnet, you can try using an extinguisher. Otherwise, stay away and let professionals handle it.
4. **Stay Safe:** Don't try to fight a large fire yourself. Focus on getting to safety and waiting for help.
5. **Engage Emergency Brake:** Help prevent the vehicle from rolling, especially if the fire has affected the brakes

Drive India NSSR-RS Unit 8 (Fire Safety responsiveness)

The expected Responses reported for the unit and it's enabling of road safety

Added notes:

For First Responders (Firefighters)::

1. A. Safe Positioning:

2. Prioritize safe and secure positioning for fire apparatus and personnel, considering uphill and upwind locations.

3. B. High Visibility:

4. Firefighters should wear retro-reflective material during fire suppression and high visibility garments when not directly exposed to fire.

5. C. Distance:

6. Maintain a safe distance from the burning vehicle.

7. D. Fire Suppression:

8. Firefighters will use various techniques to extinguish the fire, potentially including using water, foam, or other extinguishing agents.

(Road Safety/Support Planner)



RITP/Votary Track for Ambulances

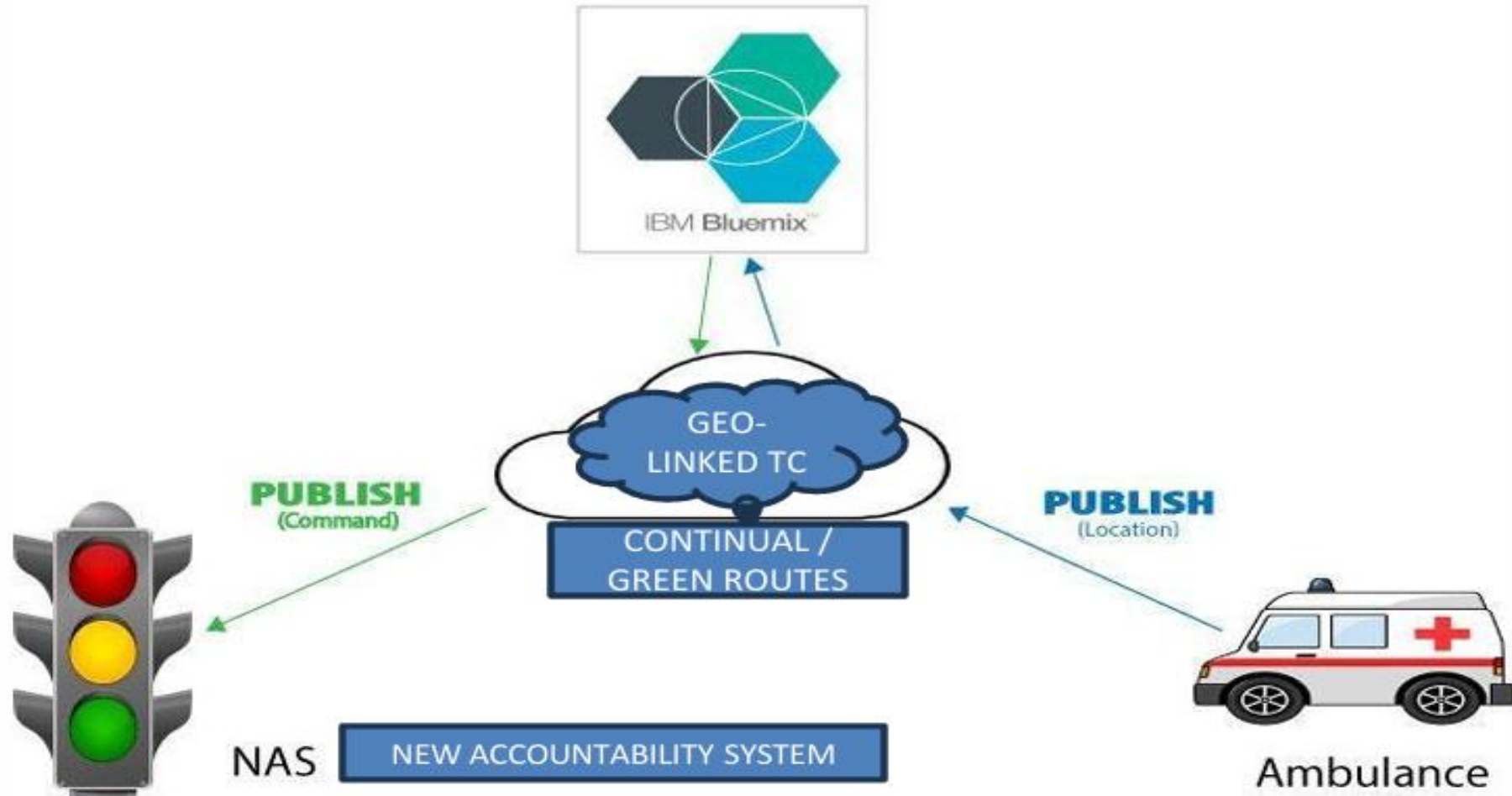


1. Self-preparedness
2. Publishing of RITP/Votary Track Lifecycle for trip

COPQ/DRONE VISION
CONTINUUM AND
PMS/PRM levels

**NSSR Road Safety Themes and relevance for safety
on road and supportive traffic control**

Traffic Management Server



ROAD INFRASTRUCTURE TRANSFORMATION PROGRAMME

SMART Ward Management Accountability Level: PMS/PRM/NA

IMPORTANT DETAILS

Vehicle registration number:

**Road Safety
Level Card Id:**

Date of submission:

Time of submission:

BASIC CHECKLIST FOR SERVICE PRODUCTION AND SERVICE ENABLING

Does the ambulance adhere to statutory requirements? Yes/No/Partially

Does the ambulance driver comply with self-assessment for fitness?
Yes/No/Partially

Does the ambulance driver expect to use drive guidance? Yes/No/Partially

Does the ambulance driver expect to use route editioning? Yes/No/Partially

Is the ambulance in good quality condition? Yes/No/Partially

Is the ambulance appropriately equipped? Yes/No/Partially

Is the ambulance manned by trained personnel? Yes/No/Partially Is

the ambulance checked on a daily basis? Yes/No/Partially

Status for norms specific checklists:

- ☐ Recent Air pressure checkup
- ☐ Recent Engine oil checkup
- ☐ Recent Brake oil checkup
- ☐ Recent Coolant level checkup
- ☐ Recent Battery acid level checkup
- ☐ Recent Solar panel or electric system checkup
- ☐ Recent Emission level checkup
- ☐ Drive guidance systems checkup

Are the equipment on board checked on a daily basis using a checklist?
Yes/No/Partially

Are emergency medications checked daily and prior to dispatch using a checklist? Yes/No/Partially

Does the ambulance have a proper communication system?
Yes/No/Partially

ONBOARD CARE CHECKLIST FOR SERVICE INTERACTION

Do documented policies and procedures guide the uniform use of cardio-pulmonary resuscitation throughout the organization? Yes/No/Partially

Are staff providing direct patient care trained and periodically updated in cardio-pulmonary resuscitation throughout the organization?
Yes/No/Partially

Are the events during a cardio-pulmonary resuscitation recorded?
Yes/No/Partially

Does a multi-disciplinary committee conduct a post event analysis of all cardio-pulmonary resuscitations? Yes/No/Partially

Are corrective and preventive actions taken on the basis of the analysis of all cardio-pulmonary resuscitations? Yes/No/Partially

Do only qualified personnel order, plan, perform and assist in performing procedures? Yes/No/Partially

Is sufficient care available for patients in a critical condition or in a deteriorating condition - being brought in from other facilities?
Yes/No/Partially

ELIMINATING ERROR CHECKLIST FOR SERVICE ENABLING/INTERACTION

Do documented procedures exist to prevent adverse events like wrong patient, wrong side and wrong procedure? Yes/No/Partially

Is informed consent taken by personnel performing the procedure, where appropriate? Yes/No/Partially

Is there adherence to standard precautions and adherence to asepsis during the conduct of the procedure? Yes/No/Partially

Are patients appropriately monitored during and after the procedure? Yes/No/Partially

Are procedures documented accurately in the patient record? Yes/No/Partially

SMART WARD PORTFOLIO ACCOUNTABILITY

Does the vehicle usage and quality adherence report a conventional Road Safety Level? Yes/No/Partially

Does the vehicle usage and quality adherence report a non-conventional Road Safety Level? Yes/No/Partially

Does the vehicle usage and service lifecycle perform with cost of poor quality related PMS (Preparedness-Mitigation-Support)? Yes/No/Partially

Does the vehicle usage and service lifecycle perform with cost of poor quality related PRM (Preparedness-Readiness-Mitigation)? Yes/No/Partially

AS FOCUS FOR SMART WARD PORTFOLIO ACCOUNTABILITY

Does the vehicle usage, service design and quality adherence ensure Quality of information for Emergency response/Accident care/incidences due to lack of Road Safety Levels? Yes/No/Partially

Does the vehicle usage, service design and quality adherence ensure Quality of process for Emergency response/Accident care/incidences due to lack of Road Safety Levels? Yes/No/Partially

Does the vehicle usage, service design and quality adherence ensure Quality of outcome for Emergency response/Accident care/incidences due to lack of Road Safety Levels? Yes/No/Partially

Does the vehicle usage, service design and quality adherence ensure Quality of service for Emergency response/Accident care/incidences due to lack of Road Safety Levels? Yes/No/Partially

Does the vehicle usage, service design and Quality of service need Quality promotion in SMART / WIP Ward management? Yes/No/Partially

Does the vehicle usage, service design and Quality of service need Continual Quality Improvement in SMART / WIP Ward management? Yes/No/Partially

Does the vehicle usage, service design and Quality of service need reports on any SMART / WIP Ward management patterns or status assessments? Yes/No/Partially

Does the vehicle usage, service design and Quality of service need reports on any Fire and Emergency Service Actuation patterns or status assessments? Yes/No/Partially

Does the vehicle usage, service design and Quality of service need reports on any NSSR Road Safety patterns or status assessments? Yes/No/Partially

RITP/Votary Track for Air Ambulances



1. Self-preparedness
2. Publishing of RITP/Votary Track Lifecycle for trip

COPQ/DRONE VISION
CONTINUUM AND
PMS/PRM levels

Reference: An Emergency Medical Services & Disaster Management publication by key authors from AIMS, AFMC, Directorate General Assam Rifles

Background

What is an air ambulance?

It is usually a helicopter or a small air plane. We can contemplate the use of a drone but will take this up in our Drone Vision programme for 2026.

The advantage of using a helicopter is that a runway is not required, which is most important for location or incidence specific scene calls, inter-facility transfer, and even search & rescue operations on roads and associated road systems.

The problem with helicopters is that they have the following limitations:

1. Altitude is limited
2. Restrictions on night flying
3. Load capacity is limited
4. Interior space is limited
5. Flying time (as per 2008 records) is about 2-3 hours without refueling

Why needed?

Tomorrow air ambulances will help us save life or provide timely assistance to people via an emergency response network that designs and incorporates response for scene calls, air lifts of people or loads, helps transfer patients from remote locations and in cases where hospitals have inadequate medical facilities for ventilator support, urgent angioplasty bypass, or even ICU/CICU facilities.

Some scenarios exist where air ambulances are being made available or have been used in India, but the coordination with an emergency response network is not available.

Problems affecting air ambulances

The problem is that in India, air ambulances are not common so there no dedicated aircrafts available in all cities or locations.

Rapid approval when relevant for air ambulances is not easily possible. There is no proper communication protocol between authorities for the same.

Added to this there are no air ambulance (helicopter/UAV) span markers planned on PMS/PRM ACCENTUATED road systems to help pilots land/take off/ air lift on a need basis.

Added to this there are no cable span markers planned on road systems to warn helicopter pilots of the presence of electric/telephone/cable television wires/router connectivity wires in an area needing air lifts.

ROAD INFRASTRUCTURE TRANSFORMATION PROGRAMME

SMART Ward Management Accountability Level: PMS/PRM/NA

IMPORTANT DETAILS

Aircraft registration number:

**Road Safety
Level Card Id:**

Date of submission:

Time of submission:

BASIC CHECKLIST FOR SERVICE PRODUCTION / SERVICE ENABLING

Does the air ambulance adhere to statutory requirements? Yes/No/Partially

Does the pilot have adequate experience and yearly certifications?
Yes/No/Partially

Does the pilot and co-pilot (if relevant) know about the regulations imposed by civil aviation and associated public safety authorities?
Yes/No/Partially

Does the pilot expect to use flight or location guidance? Yes/No/Partially

Does the aircraft used as an ambulance have proper communication systems? Yes/No/Partially

Is there appropriate communication equipment both internal (for air medical teams) and between the air crew/clinical aiding crew/assisting agencies like the emergency response network, public safety agency or ground emergency healthcare service providers? Yes/No/Partially

Is the aircraft in good quality condition? Yes/No/Partially

Is the air ambulance appropriately equipped for different emergency services? Yes/No/Partially

Is the air ambulance manned by trained air medical teams / clinical crew/ aircraft maintenance personnel? Yes/No/Partially

Are all the equipment on board checked before any flight or transfer using a checklist? Yes/No/Partially

Are emergency care medications checked systematically and prior to flight using a checklist? Yes/No/Partially

Is the air ambulance checked for an all clear prior to any emergency response or transfer? Yes/No/Partially

Does the aircraft undergo frequent inspection and maintenance by the civil aviation authorities or departments? Yes/No/Partially

Is the aircraft equipped with survival gear, sophisticated navigation equipment and weather monitoring aids? Yes/No/Partially

Does the aircraft have any pressurizing capability (if relevant)?
Yes/No/Partially

Are all fragile equipment secured from free movement during flight, as they are known to lead to erroneous or erratic readings? Yes/No/Partially

Does the aircraft have restraint straps so that the patient does not fall off from the stretcher or level of care arrangement during transport, turbulent weather and/or treatment? Yes/No/Partially

Does the configuration of the aircraft permit healthcare providers or air medical teams to perform emergency procedures if necessary?
Yes/No/Partially

Does the aircraft have an entry that permits easy loading or unloading without excessive manoeuvring of the patient? Yes/No/Partially

Does any manoeuvring not impact the functioning of monitoring systems, IV lines, ventilator systems? Yes/No/Partially

Does the aircraft have internal temperature control to prevent extremes from affecting the patient? Yes/No/Partially

Is the cockpit shielded from intrusive light, sound or movement during flight operations? Yes/No/Partially

Are electric power-outlets available with inverters or appropriate power source outputs, so as to ensure problem free operating of any medical equipment? Yes/No/Partially

Are all equipments, stretchers, seating facilities arranged for rapid air travel or passage? Yes/No/Partially

Are all equipments secured on racks, compartments or by strap restraints? Yes/No/Partially

Norms specific checklists for Service Interactions:

- [] Are there approved policies to train and educate air medical crew to ensure safe conduct in and around the aircraft
- [] Are Crew given full briefing about general aircraft safety
- [] Are Crew given full training with a structured flight program that covers altitude physiology and procedures for patient safety
- [] Is there satisfactory training given to air medical crew to use medical supplies and equipment during in-flight healthcare, medical assistance or transport
- [] Are approved policies applied for infection control with procedures for safe disposal of sharps, biological waste and contaminated materials
- [] Is there satisfactory patient record management and continuity of care
- [] Is proper training given to air medical crew for management of critically ill or injured patients at different altitudes
- [] Are emergency response network related flight or location guidance systems periodically tested and approved after structured checkups

ONBOARD CARE CHECKLIST

Do documented policies and procedures guide the uniform use of cardio-pulmonary resuscitation? Yes/No/Partially

Are air medical crew providing direct patient care trained and periodically updated in cardio-pulmonary resuscitation? Yes/No/Partially

Are the events during a cardio-pulmonary resuscitation recorded?
Yes/No/Partially

Does a multi-disciplinary committee conduct a post event analysis of all cardio-pulmonary resuscitations? Yes/No/Partially

Are corrective and preventive actions taken on the basis of the analysis of all cardio-pulmonary resuscitations? Yes/No/Partially

Do only qualified personnel order, plan, perform and assist in performing procedures? Yes/No/Partially

Is sufficient care available for patients in a critical condition or in a deteriorating condition being brought in from scene calls or other facilities? Yes/No/Partially

ELIMINATING ERROR CHECKLIST FOR SERVICE INTERACTIONS

Do documented procedures exist to prevent adverse events like wrong patient, wrong side and wrong procedure? Yes/No/Partially

Is informed consent taken by personnel performing the procedure, where appropriate? Yes/No/Partially

Is there adherence to standard precautions and adherence to asepsis during the conduct of the procedure? Yes/No/Partially

Are patients appropriately monitored during and after the procedure? Yes/No/Partially

Are procedures documented accurately in the patient record? Yes/No/Partially

SMART WARD PORTFOLIO ACCOUNTABILITY

For assisting vehicles or road ambulances

Does the vehicle usage and quality adherence report a conventional Road Safety Level? Yes/No/Partially

Does the vehicle usage and quality adherence report a non-conventional Road Safety Level? Yes/No/Partially

Does the vehicle usage and service lifecycle perform with cost of poor

quality related PMS (Preparedness-Mitigation-Support)? Yes/No/Partially

Does the vehicle usage and service lifecycle perform with cost of poor

quality related PRM (Preparedness-Readiness-Mitigation)? Yes/No/Partially

AS FOCUS FOR SMART WARD PORTFOLIO ACCOUNTABILITY

Does the vehicle usage, service design and quality adherence ensure Quality of information for Emergency response/Accident care/incidences due to lack of Road Safety Levels? Yes/No/Partially

Does the vehicle usage, service design and quality adherence ensure Quality of process for Emergency response/Accident care/incidences due to lack of Road Safety Levels? Yes/No/Partially

Does the vehicle usage, service design and quality adherence ensure Quality of outcome for Emergency response/Accident care/incidences due to lack of Road Safety Levels? Yes/No/Partially

Does the vehicle usage, service design and quality adherence ensure Quality of service for Emergency response/Accident care/incidences due to lack of Road Safety Levels? Yes/No/Partially

Does the vehicle usage, service design and Quality of service need Quality promotion in SMART / WIP Ward management? Yes/No/Partially

Does the vehicle usage, service design and Quality of service need Continual Quality Improvement in SMART / WIP Ward management? Yes/No/Partially

Does the vehicle usage, service design and Quality of service need reports on any SMART / WIP Ward management patterns or status assessments? Yes/No/Partially

Does the vehicle usage, service design and Quality of service need reports on any Fire and Emergency Service Actuation patterns or status assessments? Yes/No/Partially

Does the vehicle usage, service design and Quality of service need reports on any NSSR Road Safety patterns or status assessments? Yes/No/Partially

(Road Safety/Support Planner)



RITP/ Volary Track for Special Need Vehicles

Special Need Vehicles could include “Fire Engines, Emergency Response Vehicles, Disaster Management Vehicles, Hazardous Waste Vehicles, Hazardous Goods and Materials Vehicles, Government Officials Convoy(s)”



1. Self-preparedness
2. Publishing of R I T P / Volary Track Lifecycle for trip

COPQ/DRONE VISION
CONTINUUM AND
PMS/PRM levels



Quality Promotion by designing a framework to

Review

Assess

Incorporate

ROAD INFRASTRUCTURE TRANSFORMATION PROGRAMME

SMART Ward Management Accountability Level: PMS/PRM/NA

IMPORTANT DETAILS

Vehicle registration number:

**Road Safety
Level Card Id:**

Date of submission:

Time of submission:

BASIC CHECKLIST FOR SERVICE PRODUCTION AND SERVICE ENABLING

Does the vehicle adhere to statutory requirements? Yes/No/Partially

Does the driver comply with self-assessment for fitness? Yes/No/Partially

Does the driver expect to use drive guidance? Yes/No/Partially

Does the driver expect to use route editioning? Yes/No/Partially

Is the vehicle appropriately equipped? Yes/No/Partially

Is the vehicle manned by trained personnel? Yes/No/Partially

Is the vehicle checked before any journey? Yes/No/Partially

Are the emergency response systems (Fire extinguishers, Sand buckets, Pollution Control Board or City Municipal recommended equipment, First-aid boxes) on board checked on a daily basis using a checklist?
Yes/No/Partially

Are the communication systems (mobiles, wireless sets, location trackers, and Ambulance & Emergency Response contact lists) on board checked prior to dispatch using a checklist? Yes/No/Partially

Status for norms specific checklists:

- [] Recent Air pressure checkup
- [] Recent Engine oil checkup
- [] Recent Brake oil checkup
- [] Recent Coolant level checkup
- [] Recent Battery acid level checkup
- [] Recent Solar panel or electric system checkup
- [] Recent Emission level checkup
- [] Drive guidance systems checkup

ELIMINATING ERROR CHECKLIST FOR SERVICE ENABLING AND SERVICE INTERACTION

Are corrective and preventive guidelines and action plans checked prior to dispatch? Yes/No/Partially

Are post-incidence conduct guidelines and action plans checked prior to dispatch? Yes/No/Partially

Are reports and mandatory records submitted after each journey to help prevent adverse events in the future? Yes/No/Partially

SMART WARD PORTFOLIO ACCOUNTABILITY

Does the vehicle usage and quality adherence report a conventional Road Safety Level? Yes/No/Partially

Does the vehicle usage and quality adherence report a non-conventional Road Safety Level? Yes/No/Partially

Does the vehicle usage and service lifecycle perform with cost of poor quality related PMS (Preparedness-Mitigation-Support)? Yes/No/Partially

Does the vehicle usage and service lifecycle perform with cost of poor quality related PRM (Preparedness-Readiness-Mitigation)? Yes/No/Partially

AS FOCUS FOR SMART WARD PORTFOLIO ACCOUNTABILITY

Does the vehicle usage, service design and quality adherence ensure Quality of information for Emergency response/Accident care/incidences due to lack of Road Safety Levels? Yes/No/Partially

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Does the vehicle usage, service design and Quality of service need reports on any NSSR Road Safety patterns or status assessments? Yes/No/Partially

(Road Safety/Support Planner)





Disaster/Impactful Events on road

Background for afflicted or impaired co-passengers:

The afflicted person is affected by personal limitations or differences in the ability to do things like a normally able person.

In this condition, the person will be helped by assistive systems that instrument/improve

- Learning ability
- Training ability
- Self-developed ability/reasoning/competency
- Continual ownership to be innovative, accountable, and self-managed to mitigate **common-for-affliction** impact and setback with or without benchmarked role model or Six sigma **assistance** level specific Physically Assistive Infrastructure, Physically Assistive Technology/Systems/ Equipment/Products/Processes or Digitally Assistive Infrastructure Technology/Systems/ Equipment/ Products/Processes, Alpha Assistance (Help) Cards/Processes/Desks



Disaster/Impactful Events on road

Background for afflicted co-passengers:

The person with or without any affliction needs to learn or incorporate responsiveness to deal with limitations that affect the ability to do things or work with productivity/skills/competence. It is recommended to subscribe to or develop a Commuter Safety programme and project that helps Alpha Assistive solutions for people while travelling, where the focus could be on the following:.

☐ Alpha Assistive System for brain impairment

Notes:

☐ Alpha Assistive System for vision impairment

Notes:

☐ Alpha Assistive System for speech impairment

Notes:

☐ Alpha Assistive System for hearing impairment

Notes:

☐ Alpha Assistive System for multiple sense organ impairment

Notes:

☐ Strategy for coping up (for example the Alpha Assistance (Help) Card/Process/Desk

Notes:



Disaster/Impactful Events on road

PHOTO

Strategy for coping up - Alpha Assistance (Help) Card

Date:

Version:

Name:

Age:

Gender:

Type of impairment (Tick as applicable): Brain/Vision/Hearing/Speech/Multiple sense organs/Handicapped

Address:

Landmark to locate address:

Name of contactable parent/guardian:

Phone/Mobile:

Name of contactable caretaker:

Phone/Mobile:

Emergency contact for (any on-road incidence):

Phone/Mobile:



Disaster/Impactful Events on road

PHOTO

Alpha Assistance (Help) Card

Date:

Version:

Name:

Age:

Gender:

Alpha Assistance Processes (factors to be considered):

1. Perception ability for help/response/needful action (Tick as applicable):

Poor/ Fair/ Medium score/ Good

2. Intelligence level for help/response/needful action (Tick as applicable):

Poor/ Fair/ Medium score/ Good

3. Emotional makeup/quotient for help/response/needful action (Tick as applicable);

Poor/ Fair/ Medium score/ Good

4. Volition (Self enabled Action) level for help/response/needful action (Tick as applicable);

Poor/ Fair/ Medium score/ Good



Disaster/Impactful Events on road

PHOTO

Alpha Assistance (Help) Card

Date:

Version:

Name:

Age:

Gender:

Languages understood:

Sign Language:

Interpretation for scores:

PIEV Ability	Poor	Fair	Medium	Good
Self awareness	x	√	√	√
Social interaction	x	√	√	√
Response to new/ unmanaged environment / Weather conditions	x	x	x	√
Recognition level for people/vehicle/immediate kin/ co-passengers	x	x	√	√
Led by available assistance and instruction	x	√	x	√
Led by peer / mirrored behaviour	√	√	√	√
Led by known person's communication	√	√	√	√



Disaster/Impactful Events on road

PHOTO

Alpha Assistance (Help) Card

Date:

Version:

Name:

Age:

Gender:

Alpha Assistance Processes (needed):

1. Assistance procedure in Emergency (Tick as applicable):

Ask me/ Refer Help Card/ Call parent/guardian/ Call contact/ Contact Alpha Assistance Desk

2. Assistance procedure in Vehicle Breakdown (Tick as applicable):

Ask me/ Refer Help Card/ Call parent/guardian/ Call contact/ Contact Alpha Assistance Desk

3. Assistance procedure in Due Relief for any situation (Tick as applicable):

Ask me/ Refer Help Card/ Call parent/guardian/ Call contact/ Contact Alpha Assistance Desk

4. Assistance via Alpha Assistance Desk (Tick as applicable):

Responsive to instructions/ Trained to respond/Under training/Not under training/Cannot be trained



Disaster/Impactful Events on road

PHOTO

Alpha Assistance (Help) Card

Date:

Version:

Name:

Age:

Gender:

Additional Alpha Assistance Processes (notes):



Disaster/Impactful Events on road

PHOTO

Alpha Assistance (Help) Card

Date:

Version:

Name:

Age:

Gender:

Alpha Assistance Desk (notes):

Registered (Tick as applicable): Yes/No/Not applicable

Expectation for PIEV Ability (Tick as applicable):

Self-ability/Responsive/Needs Guidance/Needs Careful interaction/ Not known

Trained for PIEV Ability (Tick as applicable):

Via Self-development programmes/Via Family Services/ Via Awareness & Advocacy programmes/ Not trained

Part of any Alpha Assistance R&D Project (Tick as applicable):

Yes/No/Not applicable

Details:

Has a Deep Interaction Link (DIL) for Alpha Assistance (Tick as applicable):

Yes/No/Not applicable

Details:



Disaster/Impactful Events on road

PHOTO

Alpha Assistance (Help) Card

Date:

Version:

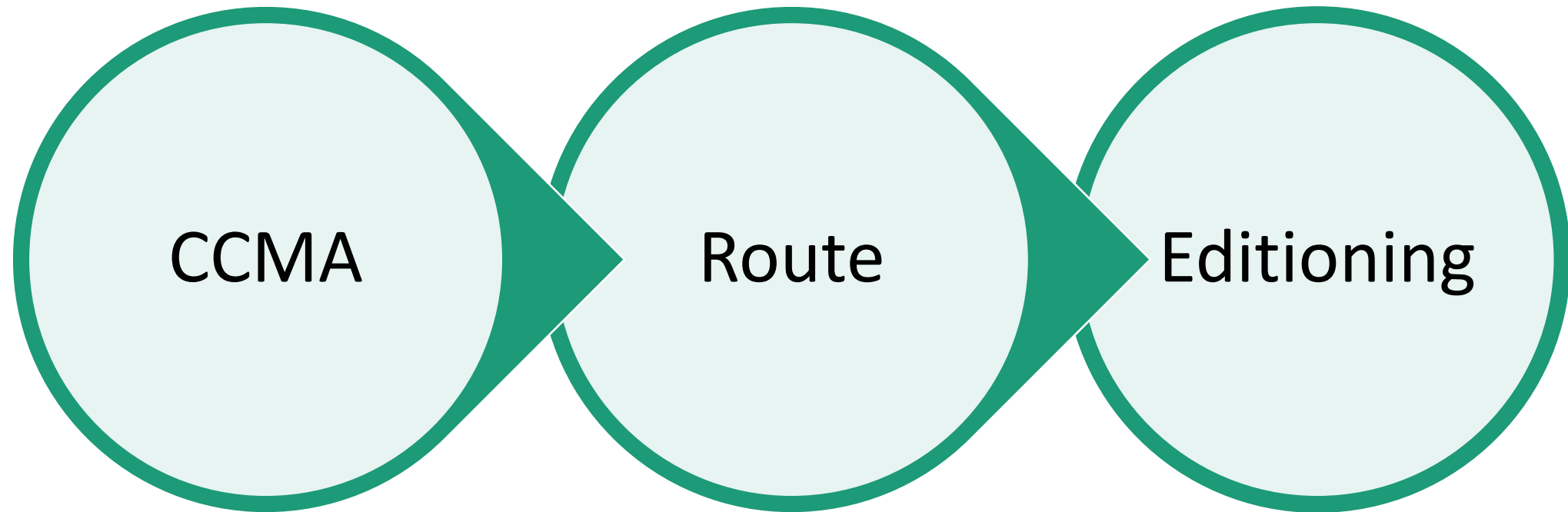
Name:

Age:

Gender:

Additional Alpha Assistance Desk (notes):

(Road Safety/Support Planner)



DRAWING TO LIFE INDIA

**FROM NAMMA
BENGALURU**



NSSR RS Programme

Know the need for
IRSE Editioning

AOEC 2024-2025 for
For SMART Vision enabled
Road Safety Acceleration

Know the need Questionnaire

Q1: Does the route need awareness of mandatory traffic signs?

Rating: Yes/ No/ Neutral

Q2: Does the route need awareness of cautionary traffic signs?

Rating: Yes/ No/ Neutral

Q3: Does the route need awareness of danger/alarm/emergency traffic signs? Rating: Yes/ No/ Neutral

Q3.1: Does the route need risk/danger/hazard detailing elements like “Road Arboriculture signages”? Rating: Yes/ No/ Neutral

Know the need Questionnaire

Q4: Does the journey need awareness of drowsy driving?

Rating: Yes/ No/ Neutral

Q5: Does the journey need awareness of night driving or fog afflicted driving? Rating: Yes/ No/ Neutral

Q6.1: Does the route need road system understanding?

Rating: Yes/ No/ Neutral

Q6.2: Does the route need driving conditions responsiveness?

Rating: Yes/ No/ Neutral

Know the need Questionnaire

Q7: Does the journey need a “first aid kit and the training to use it”?

Rating: Yes/ No/ Neutral

Q8: Does the journey need Alpha Assistance Card planning?

Rating: Yes/ No/ Neutral

Q8.1: Does the journey need SMART Vision understanding/assistance? Rating: Yes/ No/ Neutral

Know the need Questionnaire

Q9.1 Does the route need road system understanding?

Rating: Yes/ No/ Neutral

Q9.2 Does the route need driving responsiveness for giving right of way to ambulances, fire & emergency services, unaware people or pedestrians?

Rating: Yes/ Neutral

Q9.3 Does the route experience supply chain movement?

Rating: Yes/ Neutral

Know the need Questionnaire

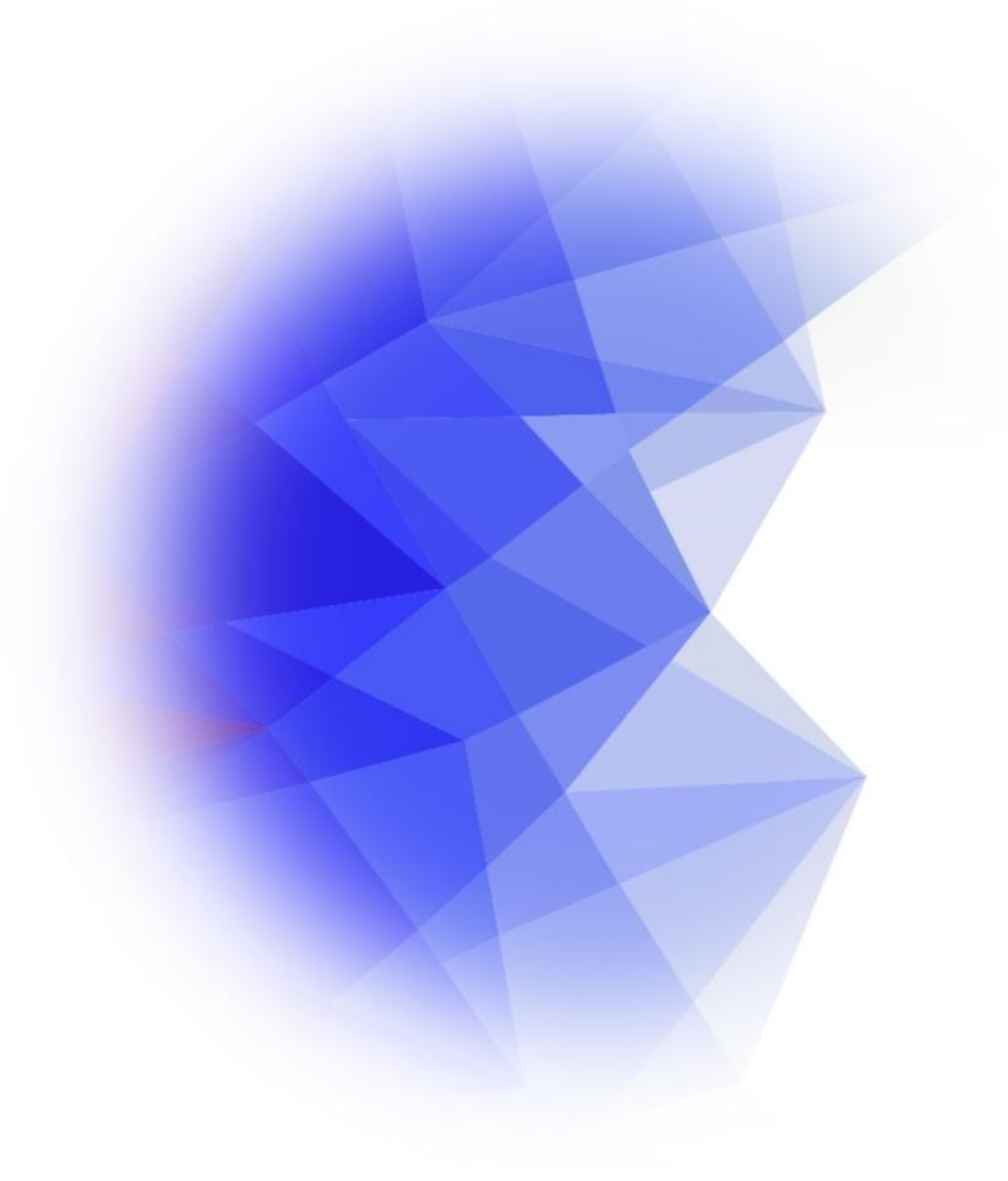
Q10.1 Does the route need illustrations of the active safety systems recommended by the dealer network and the IRSE editioning for mainline crisis reduction? Rating: Yes/ No/ Neutral

Q10.2 Does the route need illustrations of the passive safety systems recommended by the dealer network and the IRSE editioning for mainline crisis reduction?
Rating: Yes/ No/ Neutral



(Road Safety/Support Planner)



An abstract graphic on the left side of the slide, composed of numerous overlapping, semi-transparent blue triangles of various shades. These triangles form a complex, crystalline shape that resembles a stylized arrow or a cluster of facets, pointing towards the right. The overall effect is a sense of depth and dynamic movement.

DEEP INTERACTION LINK FOR AUTOMOBILES AND BRANDS

INNOVATION FOR AUTOMOBILES AND BRANDS

- Manufacturer connected dealers or independent dealers in a city, neighborhood and strategic location are most frequented by people of different backgrounds.
- Along with any interest for a brand/model/variant, most of the people select automobiles based on a
- A. Desire to own or Cause specific response OR B. Intelligently Guided response, where the important quality attributes are
- 1. Vehicle details 2. Value for money 3. Aesthetics 4. Perceived Quality 5. Forward Lifetime theory, 6. Brand Value pertaining to the vehicle detailing, or insights for any voice of customer information such as unique features of the brand, the model, the variant, with any ease of ownership grade (we call this Deep interaction for the Juran Trilogy, as this is seen as inferential rather than today's custom previews or showcasing of analysis) for the targeted market, the customer segment, the manufacture-AND/OR assemble-AND/OR import to sell programme, the vision specific dealership and supplier networking, the-design for service-to-customers processes, and the assisted layering and stake-holding of any likelihood of concerns for the diversity in customer expectations

INNOVATION FOR AUTOMOBILES AND BRANDS

- For the mobility needed today, Expectations of vehicle detailing, connected analytics information and ease of ownership based quality attributes are emerging to be important for brand identity and brand-value-stream-mapping.
- AOEC's idea or innovation is to add a Deep Interaction Link (label or tag) to the automobile/part/component/product in its original vehicle branding, in order, to help a manufacturer/dealer/supplier/stakeholder/customer enter the link into a web browser, or TGMB unifying showcase to review an Integrated principle for quality control factors and attributes.
- The integrated principle for quality control could on incorporation for an automobile/part/component/product add pertinent or deep interaction attributes like reliability, procurement enablers, process level, and verification attributes like the doing business factors, service quality model, service anywhere anytime norms like nutshell inventory, part fitness, vehicle management, ticketing and innovative "voice of customer" features that help infer more about the right vehicle suitability, right advertising, right channelling, right influencing and if possible inferential quality analysis like links to reviews, vehicle lifecycle-assessments, focus groups, staff/employee/spokesman reviews, .Deep interaction "TGMB unifying-points" that evaluate the principle for quality control.
- The Deep Interaction Link (label or tag) is based on the Juran Trilogy of implementing Quality Planning, Quality Control and Quality Improvement to manage the cost of poor quality or quality recognition and brand equity enablers for vehicle suitability for voice of the customer factors, and global & mutually beneficial attributes

INNOVATION FOR AUTOMOBILES AND BRANDS

- The Deep Interaction Link will also need the dealer to integrate additional activities
 - ❑ Complaints redressal for brand equity or ease of ownership
 - ❑ Product liability details for brand equity or ease of ownership
 - ❑ Product recall, returns for brand equity or ease of ownership
 - ❑ Management of waste and with or without salvaging of items that can be reused/recycled, to manage the issues of Loss of reputation, loss of goodwill, loss in business share, delay or stoppage of supply
- The emphasis for this innovation is to help dealers incorporate BI/CQI facts based or quality based decision making, relationship management for the principle for quality control, quality control tools and lean principle tools that reduce gaps for asset accountability, defects, variance, waste in what is seen as responsive & repetitive need for quality emphasis or call to plan emphasis, when the quality standards are not always adherent to multi-regulatory interests.

INNOVATION FOR AUTOMOBILES AND BRANDS

- The Deep Interaction Link will help work across brands/silos where this innovation can associate a Fast Track Pertinence, Action Centre, Unifying Showcase Help Desk (USHD) and Brand Equity Development Programmes that commuters, dealerships and their networks can intend to take up as case study or as different solution finding initiatives.
- Continual focus can add preponderance of possibilities, and business insights of tomorrow into relevant classes of automobiles/parts/components/products/goods.
- Ask for a case study or solution finding, by contacting us on M 9342867666 or by emailing us on venkataoec@gmail.com
- Our TGMB Unifying Showcase URL for this <https://venkataoec.wixsite.com/deeper-interaction-a>
- Our indications are that global automotive operating system market will need to use a foundation called the TGMB unifying fundamentals for the projectization of any releases or versioning

INNOVATION FOR AUTOMOBILES AND BRANDS

- TGMB unifying fundamentals
- Safer Commuting is one of the main unifying fundamental for automobile manufacturers and dealerships. The interest is to implement the same via a TGMB Dashboard framework.
- AOEC proposes a Safer Commuting related Unifying Showcase Help Desk for this insight.
- We will be updating more details on our deep interaction link website. The TGMB Unifying Showcase URL for this is <https://venkataoec.wixsite.com/deeper-interaction-a>
- AOEC summarizes the problem description for unified safer commuting to be as follows.

INNOVATION FOR AUTOMOBILES AND BRANDS

- Problem description: Automobile Brand Equity Development Programmes for Safer Commuting will need to develop more hazards warning systems or imagery services to achieve a concept called Call-to-attention-mitigation of risks known to occur daily or incidentally due to road systems.
- The Safer Commuting solution will need to define the value stream mapping for this Call to attention mitigation of road systems risks with knowledge / key opinion or Call-to-attention enabling Road System PI(s), KPI(s) or PI independent Kanban First Views for road systems affected by severe driving conditions.
- Severe driving conditions can be designed by Serial Numbered Focus (SLNF) Analytics, or Showcase Numbered Focus (SWNF) Analytics, or Docked View Numbered Focus (DVNF) Analytics
- Further more, today most automobile manufacturers deliver OTA packages for connected vehicle features. The Safer Commuting solution can be incorporated via OTA like connected vehicle themes, that are developed for (1) an evaluated Road System/Route or for (2) a Commuting theme like the LOD or Map View enabled Call-to-attention-mitigation of risks for severe driving conditions OTA stands for Over The Air networking, LOS stands for Line of Sight

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BENGALURU**



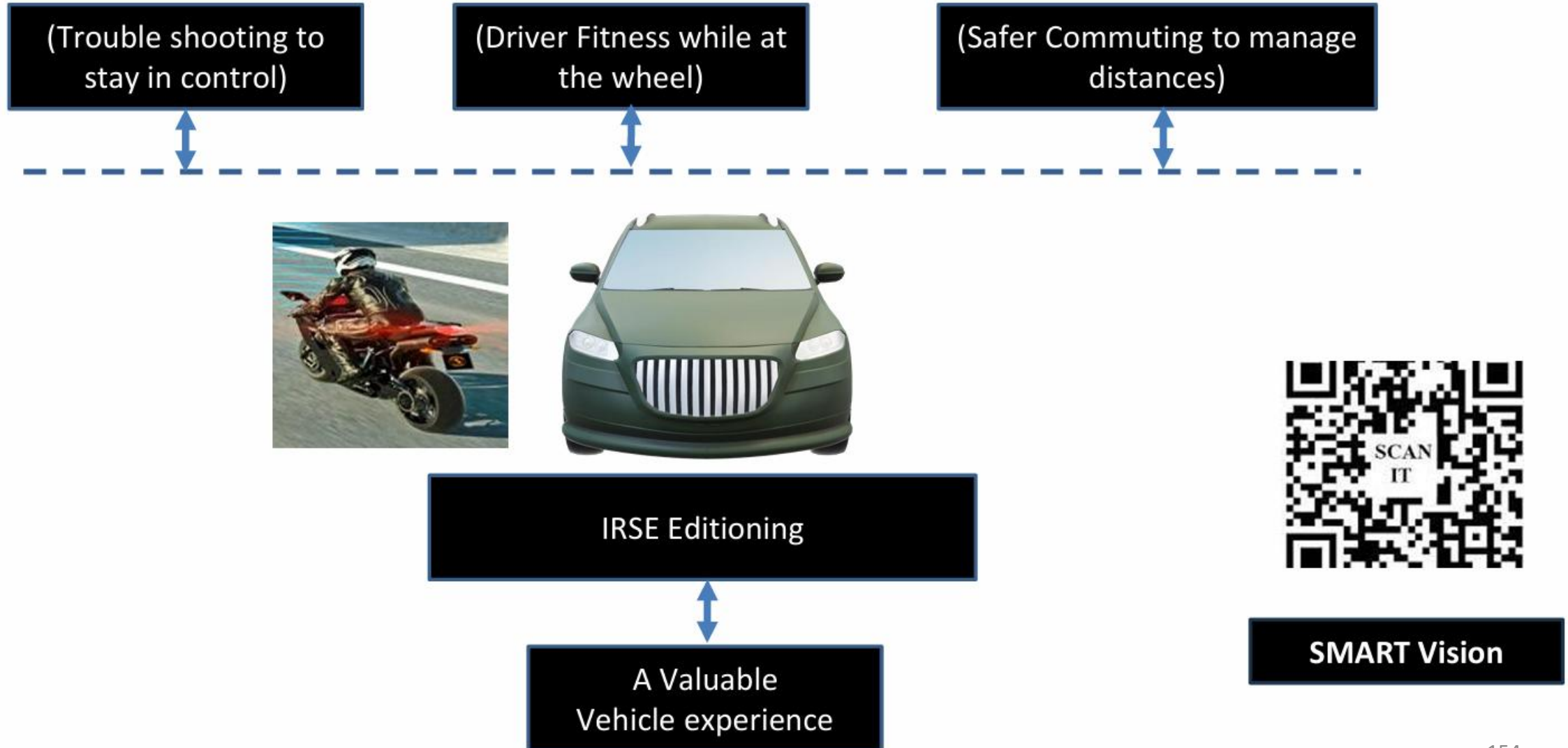
NSSR RS Programme

ACTIVE SAFETY SYSTEM
EXHIBITS

(For e.g. two wheelers,
four wheelers)

AOEC 2024-2025 for
For SMART Vision enabled
Road Safety Acceleration

YOUR VEHICLE DEMYSTIFIED



ABS Performance

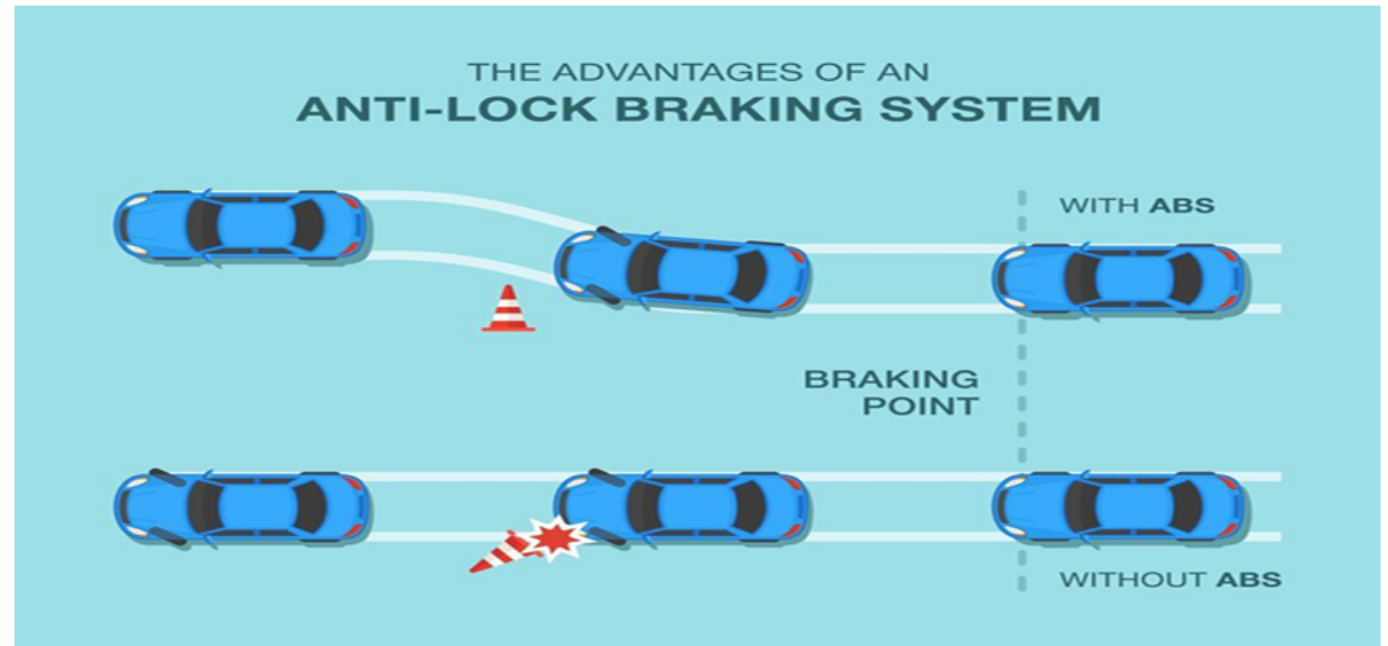
ABS stands for Anti-lock braking system. It is incorporated in two wheelers, four wheelers, commercial vehicles.

ABS incorporated Vehicle Experience

- ✓ ABS helps safe and effective braking
- ✓ ABS improves control over steering during braking
- ✓ ABS improves control over vehicle during cornering
- ✓ ABS improves tyre life
- ✓ ABS reduces fuel consumption



SMART Vision



ARAS Performance

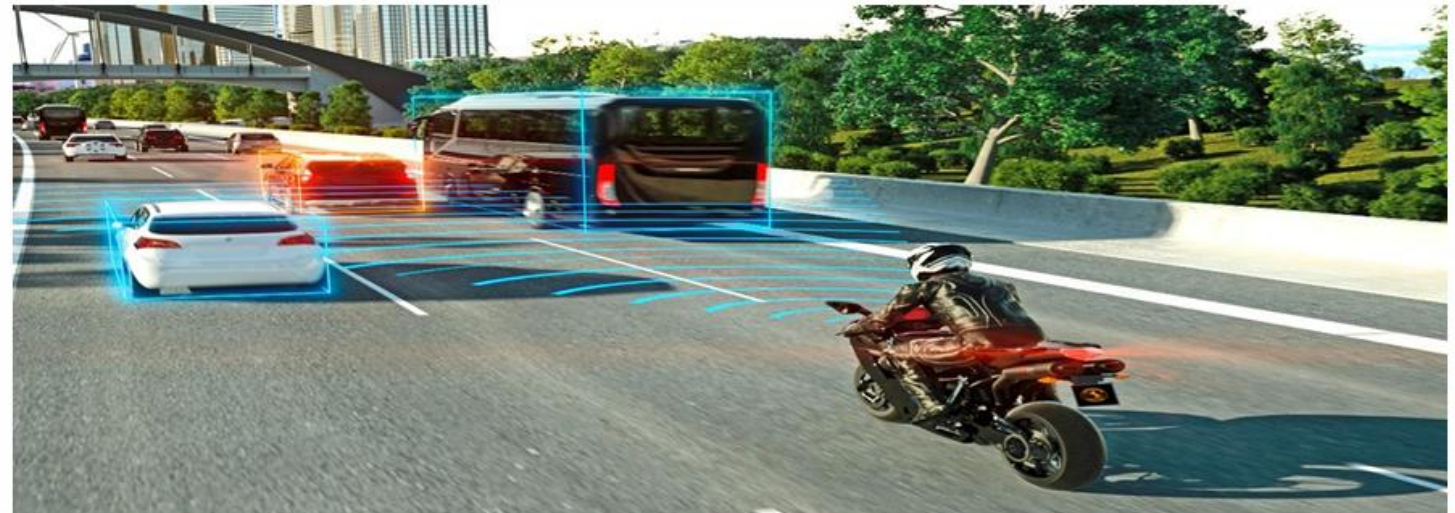
Advanced Rider Assistance Systems (ARAS) is often incorporated in two wheelers

ARAS Vehicle Experience

- ✓ ARAS improves safety and enhances rider assistance
- ✓ ARAS improves riding control in different situations
- ✓ ARAS enables alerts for Blind spot detection (BSD)
- ✓ ARAS enables Lane change assistance (LCA) at higher relative speeds
- ✓ ARAS enables high frequency hazard lights for Rear end collision warning (RCW)
- ✓ ARAS delivers effective Forward collision warning (FCW)
- ✓ ARAS enables comfortable, safe distance riding and Adaptive Cruise Control (ACC)



SMART Vision



EBA Performance

Emergency Braking Assist (ARAS) is often incorporated in two wheelers/four wheelers and CMV(s)

EBA Vehicle Experience

- ✓ EBA improves safety and control in driving
- ✓ EBA assists braking on collision risk
- ✓ EBA improves safety in sudden and forceful braking
- ✓ EBA reduces stopping distance
- ✓ EBA works effectively in cross traffic situations
- ✓ EBA assists and improves pedestrian safety



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TPMS Performance

Tyre Pressure Monitoring System is often incorporated in two wheelers, four wheelers and commercial vehicles

TPMS Vehicle Experience

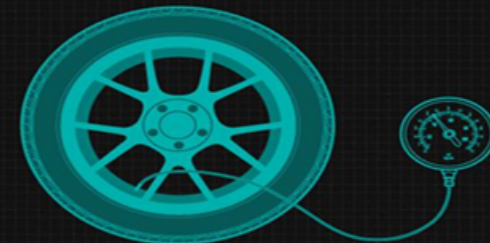
- ✓ TPMS improves handling and stability in driving
- ✓ TPMS alerts when tyre pressure is low
- ✓ TPMS improves safety by reducing the wear of tyre or incidences of a blow-out / punctured tyre
- ✓ TPMS improves fuel efficiency
- ✓ TPMS reduces hydroplaning when an under-inflated tyre loses contact with the road surface in wet conditions
- ✓ TPMS ensures proper stopping distance

SMART Vision



HOW TO CHECK TIRE PRESSURE

1. Start with cold tires
2. Check the manufacturer's recommended PSI
3. Write down each tire's PSI
4. Check tire pressure with your gauge
5. Fill to recommended PSI
6. Repeat every month



AHO Performance

Automatic Headlamp on is often incorporated in two wheelers, four wheelers and commercial vehicles.

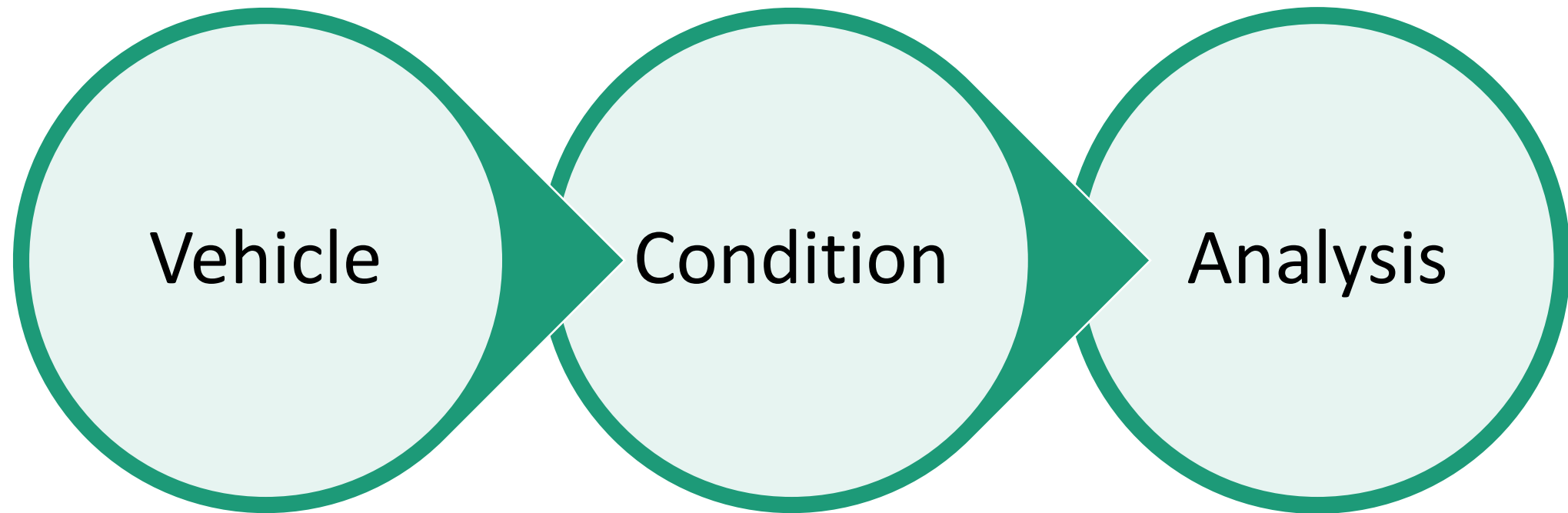
AHO Vehicle Experience

- [] AHO improves safety and visibility in driving
- [] AHO turns on automatically when the engine is started
- [] AHO turns off only when the engine stops
- [] AHO improves visibility at night, in rain, or in fog or in dusty conditions
- [] AHO improves rear view mirror visibility of 2 wheeler and its vehicle information
- [] AHO does not drain the battery when ON

SMART Vision



Vehicle Condition, or Telemetry-or-Sensor-control Assistants





**Guidelines for
Structural Body
Work**

VEHICLE TROUBLE
SHOOTING
RECKONER

Guidelines for STRUCTURAL BODY WORK

Being Anywhere at Any time needs you to be sensitized towards structural body work that is as relevant to the Brand, Model and Variant of the vehicle) . Most dealerships and service centres consider Accidental Body Work to be a mainstream issue, and allot specialists for the necessary work

Start by reviewing related principles for body work

- **Body build** to accommodate body shell assembling, body parts and pressings for front end, rear end, floor, sides etc
- **Strength** to withstand all types of forces like (weight of vehicle, driver, systems), (inertia, braking and side forces), (impact loads of reasonable magnitude)
- **Stiffness** to resist twisting on bad tracks and sagging in the middle
- **Space** (planned outline, adequacy for driver, improved power-to-weight ratio, costs for incorporation)
- **Minimum Air drag** during movement
- **Resistance to corrosion** (minimum moisture accumulation, material should be rust free and anti-corrosive)

Guidelines for STRUCTURAL BODY WORK

Continue by reviewing important principles for body work

- **Whether painting has been done in stages?** Multi-part rust proofing treatment, surface epoxy priming, under body coating. Complete body base coat with special adhesion qualities with interim rubbing, washing, cleaning of surfaces to be painted
- **Whether sealing has been done in stages after preparing clean and dry surfaces?** For example Panel seams, floor pan to withstand stone pecking
- **Whether there is Protection in normal driving or accident (specific to Vehicle dynamics – Higher shock loads?)**
- **Whether there is Protection in normal driving or accident (specific to Visibility – Eye position of driver, angle of visibility, spacing for seating, need for rearward visibility?)**
- **Whether there is Protection in accidents (specific to Effect of Collision – Front, Rear, sides, tilt, roll over)**
- **Whether there is Protection in driving or collisions (There should be no items coming loose)**
- **Whether there is Protection in accidents (specific to Hertomatic Flashers and beepers – ignition automatically turning off)**

Guidelines for STRUCTURAL BODY WORK

Continue by “material anti-quality” work estimation

- Whether the material used for body parts has been evaluated properly? Specific to reasons (such as ductility for fabrication, tension loading, minimum yield strength, density, elastic modulus, improved conductivity and weld-ability)
- Whether the material used for body pressings has been evaluated properly? Specific to reasons (such as heat treatment, formability, indentation resistance to complex twisting, fabric-ability, minimum yield strength, structural loading and failure strength, weld-ability, painting system requirements)
- Whether shatterproof glass material has been used where needed?
- Whether seat backs are in an upright position?
- Whether seat belts are functional? Are they non-retracting or automatically retractable depending upon ride experience? Whether the seat belt system works satisfactorily?
- Whether there is functional and right incorporation of head restraints?

Guidelines for STRUCTURAL BODY WORK

We continue by anti-quality work estimation for the vehicle's body

- ☐ Are there issues with the vehicle design that affect the stability and performance of the vehicle
- ☐ Are there on-road-ride stability, and performance issues
- ☐ Are there issues with the vehicle manufacturing or customization
- ☐ Are there important body work quality issues
- ☐ Are there important body part quality issues
- ☐ Are there ICE to EV / Hybrid conversion issues
- ☐ Are there crash impact mitigation issues
- ☐ Are there issues with past Maintenance, Repair and Tuning
- ☐ Are there cost for ownership issues

Guidelines for STRUCTURAL BODY WORK

We review concerns with rules and regulations

- ☐ Are there RTO compliance issues
- ☐ Are there issues of violations or penalties being imposed
- ☐ Are there specific issue RTO or legal resolutions still ongoing
-

Guidelines for STRUCTURAL BODY WORK

Vehicle Inspection

Category	Ok	Not Ok	Remarks
(A) Exteriors (Physical and Paint Condition)			
Body panel condition			
Body panel paint condition			
Teflon or Ceramic coating condition			
Free of body scratches			
Free of body dents			
Water resistant covers			
Fuel tank condition			
Dashboard / Speedometer condition			
Headlights focus/condition			
Taillights condition			
Indicators condition			
Brake lights condition			
Clutch condition			
Horn condition			
Choke condition			
Self-start condition			
Mirrors condition			

Guidelines for STRUCTURAL BODY WORK

Vehicle Inspection

(B) Steering	Ok	Not Ok	Remarks
Vehicle does not drift to one side without prodding			
Vehicle is stable no shaking or vibrating			
No resistance in steering when turning			
No clicking or clanking when turning			
(C) Suspension			
Vehicle rests levelly			
When bouncing the tyres/wheels no creaking noises are heard			
All tyres/wheels respond the same on bouncing			
(D) Brakes			
Vehicle steers straight and does not pull to one side when applying brakes			
No grinding noises when applying brakes			
Wheels do not lock when applying anti-brake system (if applicable)			
Brakes functioning			

Guidelines for STRUCTURAL BODY WORK

Vehicle Inspection

(E) Tyres	Ok	Not Ok	Remarks
Tyres are of a reputable brand			
Tyres are of the same make			
Tyres are free of any cuts, bubbles or cracks			
Tyres are worn evenly (uneven wear can indicate alignment and suspension problems)			
Spare tyre condition good (if applicable)			
(F) Frame			
Chassis is neither bent nor cracked			
No body part is bent nor cracked			
No petrol/diesel/oil leaks			
No signs of metal crumbling			
Frame condition is good			

Guidelines for STRUCTURAL BODY WORK

Vehicle Inspection

(G) Interiors	Ok	Not Ok	Remarks
Seat unworn and free of cracks			
All gauges work			
No dashboard warning lights (remain illuminated)			
(H) Engine			
Mileage			
Vibration/Smooth running			
Free of oil or fluid leaks			
Free of odours when engine is running			
Exhaust pipe emissions are neither blue (indicates the engine burns oil) nor black (excessive oil consumption)			
Oil filler neck not coated with thick, black deposits			
Timing Belt condition			
Battery condition			
Battery terminals free of corrosion			
Battery Management System condition			

Guidelines for STRUCTURAL BODY WORK

Vehicle Inspection

(I) Manual or standard transmission	Ok	Not Ok	Remarks
Each gear shifts smoothly			
Clutch works smoothly			
Clutch cable condition			
Adjustment / Other Clutch issues			
(J) Automatic transmission			
Transmission fluid looks clean, not dirty nor gritty (indicating no internal transmission problem)			
Transmission neither slips or delays while driving			

Guidelines for STRUCTURAL BODY WORK

Stages that are common in any service done

- (1) Gathering and analysis of the vehicle sheet
- (2) Screening of details and completion of What-is-to-be-done analysis
- (3) Addition of any Design-out Maintenance, Preventive Maintenance and Corrective Maintenance
- (4) Decision making for any Seasonal Changeover in service operations
- (5) Estimation for work, labour, and materials
- (6) Inventory of Service Centre/Workshop assets, equipment, and systems for this brand/model/variant
- (7) Level of workmanship specific analysis and decision making / corrective action
- (8) Determination of Service Centre/Workshop capacity and Reservation
- (9) Detailing of Procurements and Job execution
- (10) Availability/Revision of brand/model/variant/service manuals, product/part/system references and documentation
- (11) Time, Motion, and Scale (TMS) findings for Service Design, Engagement, Scheduling, Operations, Training and Continual Education to improve cost of ownership, cost of service, cost of workmanship, quality assurance, and environment safety

Guidelines for STRUCTURAL BODY WORK

- **Design-out Maintenance (reviewed as a concept)**
- Design-out maintenance is a strategy that aims for improvement, and its focus is the improvement of the vehicle-system design to reduce the maintenance burden or even eliminating maintenance altogether for any health parametrization.
- Re-designing of improved ergonomics of the vehicle and its systems is another prerogative of design-out maintenance.
- Management of safety related to the vehicle's crashworthiness and crash mitigation is also another area of design-out maintenance.

Guidelines for STRUCTURAL BODY WORK

- **Planned Maintenance (reviewed as a concept)**
- **Advantages**
 1. Conceived by organizational support structure
 2. Easier planning of competencies
 3. Easier Service Centre/ Workshop Management
 4. Easier planning and scheduling of maintenance
 5. Easier mechanism of ordering spares
 6. Even distribution of costs
 7. Easier mechanism for conducting trainings and skills improvement

Guidelines for STRUCTURAL BODY WORK

- **Preventive Maintenance (reviewed as a concept)**
- **Advantages**
 1. Increased part/component/system operational life or availability
 2. Allows for pre-emptive corrective action
 3. Decreases part/component/system downtime
 4. Decrease in costs for parts, components, systems and labour
 5. Better product quality
 6. Improved vehicle and environmental safety
 7. Improved brand value
 8. Energy savings
 9. Estimated 8 to 12% cost savings over simple maintenance and repair
 10. Improved use of diagnostics
 11. Improved staff expertise and skills

Guidelines for STRUCTURAL BODY WORK

- **Corrective Maintenance (reviewed as a concept)**
- **Characteristics**
 - 1. It is generally planned
 - 2. Whether it is planned or unplanned, the maintenance activity takes place depending on the nature of the problem and the type of vehicle/model/variant
 - 3. Work is taken up after the breakdown with some time tag
 - 4. Breakdown maintenance should not include maintenance activities for loss of human life, unprecedented vehicle accidents. It applies when breakdown of a part/component/system in the vehicle does not affect the entire functioning of the vehicle, or is predictable and for expected failures

Guidelines for STRUCTURAL BODY WORK

- **Crash safety (reviewed as a concept)**
- **What are the three stages of a vehicle crash?**
- There are three stages that take place: the vehicle collision, human collision, and internal (crash model specific combined) collision.
- **What is crashworthiness of a vehicle?**
- Vehicle crashworthiness is the science of focusing on protecting occupants involved in frontal, side, rear and rollover accident events through the utilization of various safety systems and safety principles. It is mainly important for 4 wheelers but has requirements in the 2 wheeler segment also.
- **How is crashworthiness determined?**
- Crashworthiness is measured after the fact by looking at injury risk in real-world crashes. Often, regression or other statistical methods are used to account for the many other factors that can affect the outcome of a crash.
-

Guidelines for STRUCTURAL BODY WORK

- **Crash safety (reviewed as a concept)**
- **What are the failure modes in crashworthiness?**
- When the failure is involved, complex failure modes, such as fiber kinking, fiber breakage, matrix cracking, matrix buckling, and delamination, etc., always occur.
- **What is the goal of crashworthiness?**
- The goal of crashworthiness research is to reduce the risk of death or severe injury in the event of an accident by designing vehicles that can better protect their occupants.
- **What are the parameters of crashworthiness?**
- Parameters include energy absorption, mean crush force, specific energy absorption, and crush force efficiencies.
-

Guidelines for STRUCTURAL BODY WORK

- **Crash safety (reviewed as a concept)**
- **What are the different types of crash analysis?**
- There are different types of crash simulations like full frontal, side, rear, rollover at vehicle level and like Crash Management System (CMS), seating, chassis or frame-component crash at system level.
- **How do you calculate crash impact?**
- The impact to your body in a crash is called crash force. Crash force is equal to your body weight multiplied by the speed of the vehicle.
- **What is the crash severity prediction model?**
- Crash severity prediction models enable various agencies to predict the severity of a crash to gain insights into the factors that affect or are associated with crash severity.
-

Guidelines for STRUCTURAL BODY WORK

- **1.a Type of vehicle (Tick as applicable):** (2W/4W/EV/Hybrid)
- **1.b Vehicle details:**
- **2. Incident details:**
- **Date:** **Time:**
- **Summary:**
- **2.a Reason (foremost):**
- ☐ **Driver factors** ☐ **Vehicle system** ☐ **Other factors**
- **2.b Summary:**
-

Guidelines for STRUCTURAL BODY WORK

- **2.c Injury to:**
 - ☐ **Driver** ☐ **Co-passengers** ☐ **Others**
- **2.d Nature of injury:**
 - ☐ **Death**
 - ☐ **Grade of injury**
 - **Details:**
- ☐ **Connected hazard**
 - **Details:**

Guidelines for STRUCTURAL BODY WORK

- **3. Nature of interest in Crash Safety Assessment**
- ☐ **Crash analysis** ☐ **Crash worthiness** ☐ **Crash protection**
- **Details:**
-
- **4. Type of collision:**
- ☐ **Frontal** ☐ **Rear** ☐ **Side** ☐ **Rollover**
- **Details:**

Guidelines for STRUCTURAL BODY WORK

- **5. Crash protection mechanism (details as part of the vehicle manual):**
- [] Front Crash Guard/Bumper [] Rear Crash Guard/Bumper [] Other Guards
- [] Crash Management System (CMS) Accessories
- [] Chassis/Frame/Vehicle Body
- [] Vehicle Engine System
- [] Wheels and Tyres (ABS, anti-skid proof, puncture proof)
- [] Seating
- [] Special Crash Management System (CMS) Accessories

Guidelines for STRUCTURAL BODY WORK

- **6. Helpful Crash Protection features (details as part of the vehicle manual):**
- [] Reliable crash worthiness mechanisms
- [] Safe mitigation of Crash impact / severity
- [] Effective (Design led) Crash Prediction Model
- [] Inadequate protection / crash worthiness

Guidelines for STRUCTURAL BODY WORK

- **7. Contributing Driver factors for incidence:**
- [] Vehicle malfunction
- [] Poor vehicle condition
- [] Human error
- [] Driver negligence
- [] Unfit to drive
- [] Over speeding
- [] Wrong side entry/driving

Guidelines for STRUCTURAL BODY WORK

- **7. Contributing Driver factors for incidence:**
- [] Poor road condition
- [] Poor road systems/infrastructure
- [] RTO / GoI Rule violations
- [] No proper seat belts
- [] No proper mirrors
- [] No proper lights
- [] No proper indicators
- [] No proper horn

Guidelines for STRUCTURAL BODY WORK

- **8. Requirements for crash management / crash worthiness**
-
- **9. Manufacturer / Dealer network enabled Simulations to understand crash worthiness:**
-
- **10. Recommendations for crash management / crash worthiness**
-
- **11. Complaints/Grievances for crash management / crash worthiness**
-
- **12. Feedback for crash management / crash worthiness**
-
- **13. Comments:**

Guidelines for STRUCTURAL BODY WORK

- **To manage your vehicle and travel better, review concepts like**
- (1) An **online / organizational database** for customers to record/manage/track nature of work done on vehicle with details of parts replacement, electric systems/parts, ECM/ECU, Battery, Battery Management System etc where the warranty is covered all over India through authorized Service Centres
- (2) A **Helpline programme** where services of Road Side Assistance and Accidental repairs are provided with vehicle pickup from any location and drop off to the nearest Service Centre
-



VEHICLE TROUBLE SHOOTING RECKONER

Guidelines for Automotive Mechanics for decision making as to whether the

[] vehicle needs to be pulled off the road

[] vehicle needs cost effective repairs to be on-road

Guidelines for Maintenance/Repair/Tuning

Being Anywhere at Any time needs you to be sensitized towards automotive mechanics that is as relevant to the Brand. Model and Variant of the vehicle)

[] Abnormal noise check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Air filter check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Battery electrolyte level check

Condition; Ok/Problematic but will function/Needs top-up or refilling/Needs replacement

[] Blinkers, bulbs and head lamps check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Bolts and Nuts tightening check (engine specific)

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

•

Guidelines for Maintenance/Repair/Tuning

Being Anywhere at Any time needs you to be sensitized towards automotive mechanics that is as relevant to the Brand. Model and Variant of the vehicle)

[] Bolts and Nuts tightening check (front and rear shock absorbers)

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Bolts and Nuts tightening check (front and rear tyres)

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Brake fluid level check

Condition; Ok/Problematic but will function/Needs top-up or refilling/Needs replacement

[] Brake disc condition check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

Guidelines for Maintenance/Repair/Tuning

Being Anywhere at Any time needs you to be sensitized towards automotive mechanics that is as relevant to the Brand, Model and Variant of the vehicle)

☐ Brake drum and lining check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Brake liners or pads check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Carburettor check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Chassis or body condition check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

Guidelines for Maintenance/Repair/Tuning

Being Anywhere at Any time needs you to be sensitized towards automotive mechanics that is as relevant to the Brand, Model and Variant of the vehicle)

[] Clutch Pedal Play

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Coolant level check

Condition; Ok/Problematic but will function/Needs top-up or refilling/Needs replacement

[] Differential oil check

Condition; Ok/Problematic but will function/Needs top-up or refilling/Needs replacement

[] Drive belts tension check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Drive shafts check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Engine oil level check

Condition; Ok/Problematic but will function/Needs top-up or refilling/Needs replacement

Guidelines for Maintenance/Repair/Tuning

Being Anywhere at Any time needs you to be sensitized towards automotive mechanics that is as relevant to the Brand. Model and Variant of the vehicle)

☐ Entire electricity cables and connections check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Exhaust system check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Fuel Lines Pipes Leakage check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Fuse box and fuses check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Gear Box oil check

Condition; Ok/Problematic but will function/Needs top-up or refilling/Needs replacement

Guidelines for Maintenance/Repair/Tuning

Being Anywhere at Any time needs you to be sensitized towards automotive mechanics that is as relevant to the Brand, Model and Variant of the vehicle)

[] Hoses, clamps and pipes check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Idling and proper acceleration check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Lubrication chart check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Power steering oil check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

Guidelines for Maintenance/Repair/Tuning

Being Anywhere at Any time needs you to be sensitized towards automotive mechanics that is as relevant to the Brand. Model and Variant of the vehicle)

[] Seat and seat bolts check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Steering mechanism and play check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Suspension front and rear check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Tappet clearance check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Transmission oil check

Condition; Ok/Problematic but will function/Needs top-up or refilling/Needs replacement

Guidelines for Maintenance/Repair/Tuning

Being Anywhere at Any time needs you to be sensitized towards automotive mechanics that is as relevant to the Brand. Model and Variant of the vehicle)

[] Trans-axle and axle check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Tyre condition check (rotate if necessary)

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Tyre pressure check

Condition; Ok/Problematic but will function/Needs refilling/Needs replacement

[] Cranking/engine sound check while being started (rotate if necessary)

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

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Guidelines for Maintenance/Repair/Tuning

Being Anywhere at Any time needs you to be sensitized towards automotive mechanics that is as relevant to the Brand, Model and Variant of the vehicle)

[] Universal joints and slip joints check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Vehicle pulling, Left wheel / Right wheel wobbling check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Wheel alignment and balancing check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement



VEHICLE TROUBLE SHOOTING RECKONER

Guidelines for Trouble shooting

Guidelines for Trouble shooting

Being Anywhere at Any time needs you to be sensitized towards vital trouble shooting that is as relevant to the Brand. Model and Variant of the vehicle)

- [] Noises (Engine, Crank, Piston, Valve Train)
- [] Pre-ignition problems
- [] Engine will not crank
- [] Engine cranks slowly but does not start (related to ICE vehicles)
- [] Overheating of engine
- [] Excessive smoke
- [] Loss of coolant
- [] Oil pressure problem

Guidelines for Trouble shooting

1. Guidelines for possible Engine noises	Source or Cause possibly
Tap sound	Improper adjustment of Valve clearance
Rattle sound	Loose or broken components like piston rings
Light knocking	Small end bearings worn out
Deep knocking	Big end bearings worn out
Irregular heavy knocking	Loose fly wheel
Rumble noise	Main bearings worn out
Slapping noise	Worn out piston or bores
Vibrating sounds	Loose fittings of components
Clatter noise	Broken rocker shaft or broken piston rings
Hiss sound	Leak from inlet or exhaust manifolds or connections
Roar sound	Air filter malfunctioning noise, Air filter failure
Clunking sound	Loose fly wheel, worn out thrust bearing, loose damper pulley
Whining sound	Malfunction in power steering or alternate bearings
Shrieking sound	Dry bearings in ancillary components
Squealing	Slipping drive belt
Snapping sound on engine overhauling	Tight fitting of piston rings

Starved sound with high -speed acceleration noise on starting -

Timing belt problems

Guidelines for Trouble shooting

2. Guidelines for possible Crank noises

Source or Cause possibly

Excessive clearance in main bearings

Main journals out of alignment

Excessive axial play in crank shaft

Low oil pressure

Unbalanced crank shaft

Loose fly wheel

Loose fitting of main journals and main bearing caps

Improper seating of thrust bearings

Loose damper pulley

Excessive play in main journal bearings

Timing belt problems

3. Guidelines for possible Piston noises (sharp noises while at idling speed)

Source or Cause possibly

Excessive side clearance

Loose fitting in small end bearing

Bent connecting rod

More clearance between piston pin and boss

4. Guidelines for possible Valve Train Noise

Source or Cause possibly

Improper adjustment of valve clearance

Bent push rod

Worn out rocker arm and valve tip

Warped valve

Carbonized or scored valve stems

Excessive clearance between valve stem and valve guide

Worn out or broken valve spring

Improper valve timing

Worn out cam lobes

Broken or damaged valve lifter

Loose fitting of adjustment screw and nut for valve tappet clearance

Guidelines for Trouble shooting

5. Guidelines for Pre-ignition problems (deposits in combustion chambers and/or on spark plugs)

Experience - poor acceleration, engine roughness and reduced top speed
Source or Cause possibly

Clogging of carburettor jets

Improper idling

Loose fitting of spark plugs

Improved driving / Maintaining constant speed when possible

6. Guidelines for Causes for the Engine to not crank or fully start

Source or Cause possibly

Defective starting motor

Defective battery

Loose connection of battery wire and starting motor wire

Fly wheel problem needing servicing

Worn out teeth of fly wheel

Slow running of armature shaft

Timing belt problems

Guidelines for Trouble shooting

7. Guidelines for the Causes for the Engine to crank slowly but does not start

Source or Cause possibly

Defective fuel pump

Fuel line blocked

Fuel filter blocked

Defective Fuel pump

Air lock or air may be present in fuel line

Less Fuel in tank

Air cleaner blocked

Defective fuel injector

Worn out valves and springs in pump

What can cause Over heating of engine Source or Cause possibly

Loose fan belt

Radiator blocked or surface area reduction

Radiator tubes blocked

Improper opening of thermostat valve

Hose pipes blocked

Coolant pump malfunctioning

Coolant jackets and hoses may be clogged

Head gasket seating improper

Coolant level low

Leakage of coolant from radiator

Early or late ignition problem

Clutch slipping

Brake jamming or drag

Tight wheel bearings

Guidelines for Trouble shooting

8. Guidelines for what can cause Excessive smoke (Black)

Source or Cause possibly

Choked Air filter

Fuel injection pump not properly calibrated

Defective injector

Defective governor diaphragm

Incorrect valve clearance

Poor compression

9. Guidelines for what can cause Excessive smoke (Blue)

Source or Cause possibly

Sticky or broken piston rings

Worn out cylinder bores

Weak compression

Oil level in oil sump not proper

Mixing of lubricating oil with fuel

Improper grade engine oil

Improper grade lubricating oil

Guidelines for Trouble shooting

10. Guidelines for what can cause Excessive smoke (White)

Source or Cause possibly

Defective valve seating

Fuel injection pump not properly calibrated

Delay between injection and combustion of fuel

More unburnt fuel

Low operating temperature

11. Guidelines for what causes the Loss of coolant

Source or Cause possibly

Radiator leakage

Hose pipe leakage

Loose drain plug or drain plug leakage

Oil seal damaged for pump

Leaky or faulty head gasket

Damaged or cracked pump casing

Improper or Loose or damaged thermostat or valve packing

Faulty or missing radiator cap

Crack in cylinder block

Engine overheating

Guidelines for Trouble shooting

12. Guidelines for Oil pressure problems (No reading)

Source or Cause possibly

No oil in sump or reservoir

Oil gauge not functioning properly

Faulty oil pump

Faulty valve or valve spring

Loose connection or Faulty pressure gauge

Leakage of oil

13. Guidelines for Oil pressure problems (low pressure reading)

Source or Cause possibly

Less oil in sump or reservoir

Oil Filter clogged

Faulty or worn out oil pump

Faulty or broken valve spring

Faulty or slack main bearings

Leakage of oil

14. Guidelines for Oil pressure problems (high pressure reading)

Source or Cause possibly

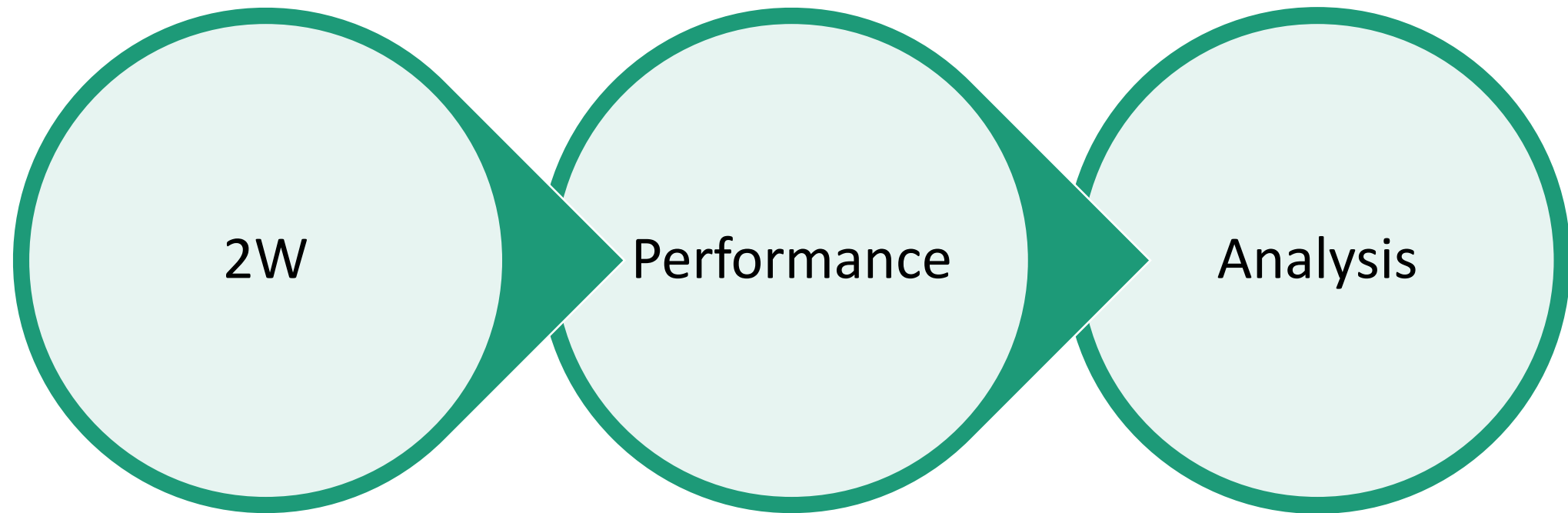
Oil lines clogged

Faulty or broken valve

Faulty or defective pressure gauge

High viscosity or improper grade oil

(Road Safety/Support Planner)



Top 10 reasons for two-wheeler accidents

1. Left-Hand Turn Accidents:

These often result from a "T-bone" collision where a driver turns left into the path of an oncoming two-wheeler, sometimes due to limited vision & attention related blindness" where the driver may look but not see the rider.

2. Rear-End Collisions:

Rear-end collisions happen when a vehicle crashes into the back of a two-wheeler, often due to inattentiveness, tailgating, or poor visibility.

3. Speeding:

Exceeding the speed limit is a major factor in accidents, increasing the severity of impacts and reducing reaction time.

4. Collisions with Heavy Vehicles:

Two-wheelers are at a disadvantage when colliding with larger vehicles, as they may not be able to stop or avoid the collision in time.



Top 10 reasons for two-wheeler accidents

5. Accidents on Wet or Slippery Roads:

Wet or slippery road conditions significantly reduce traction, making it more difficult for riders to control their bikes and increasing the risk of crashes.

6. Road Infrastructure Issues:

Factors like potholes, uneven road surfaces, low-hanging branches, or debris on the road can lead to accidents, particularly at higher speeds.

7. Lane-Switching Accidents:

Rapid lane changes or improper signaling can cause collisions with other vehicles, especially if the rider is not visible or is not aware of surrounding traffic.

8. Collisions with Pedestrians or Cyclists:

These accidents are often due to inattentiveness, failure to yield, or improper lane positioning.

9. Distracted or Inattentive Drivers:

Drivers who are distracted by phones, food, or other activities are less likely to notice two-wheelers, increasing the risk of collisions.

10. Failure to Yield the Right of Way:

Ignoring traffic laws and failing to yield to other vehicles or pedestrians is a major cause of accidents.

Guidelines that help prevent accidents in two-wheeler

WHETHER YOU OWN BIKE, OR RENT-A-BIKE or HIRE A RIDE-AS A PILLION RIDER

PRE-RIDE PREREQUISITES

1. 2-wheeler manufacturers do not know whether their vehicles will be used to transport women or children or loads without adherence to safety norms. As this does not adversely affect their markets, it may be necessary to rally collective concern that ensures that when the RTO grants licenses to owners/drivers to drive on the roads, the intent to use the 2-wheeler must be indicated for better safety.

This vehicle has a driver / owner declaration as to how the vehicle would be used: Yes/No

Driver's/Owner's statement of intent:

2. Today in India, we have different types of roads and different types of road conditions, regulations and advisories can be issued to reduce the risk faced by commuters using 2-wheelers. These can be enforced by the Traffic Police as applicable.

As 2-wheelers are risky when used in different road conditions

Does the vehicle adhere to statutory requirements (highlighted for 2-wheelers like working condition headlights, automatic turn on headlights, turn indicators, brake lights,, gear system (if with gear) and brake systems, Anti-lock Braking Systems, Emergency braking assist, rider assistance systems, tire pressure monitoring systems, use of helmets, reflective or bright clothing when driving in dim or night conditions)? Yes/No/Partially

Guidelines that help prevent accidents in two-wheeler

FUNDAMENTAL UNDERSTANDING

Anti-lock Braking System (ABS):

- ABS helps prevent wheel lock-up during braking, improving stability and reducing the risk of skidding and falls.

Advanced Rider Assistance Systems (ARAS):

- ARAS, including features like blind spot detection, adaptive cruise control, and motorcycle stability control (MSC), can aid riders in navigating and preventing accidents.

Emergency Braking Assist:

- This system can help prevent rear-end collisions, especially in situations with intersecting or oncoming traffic, by reacting faster than the rider.

Automatic Headlamp-On (AHO):

- AHO ensures that headlights are automatically switched on when the vehicle is started, improving visibility and reducing the risk of accidents at night.

Tyre Pressure Monitoring Systems (TPMS):

- TPMS alerts riders to low tire pressure, which can affect handling and increase the risk of accidents.

Guidelines that help prevent accidents in two-wheeler

Is the vehicle owner or driver (for private ride operators) holding the required licence to drive? Yes / No

If yes, is the provision for gears permitted for road system specific regulation? Yes / No

If vehicle with gear, is there any customized regulation done for the gear system to control the ensuing speed or acceleration? Yes / No

Details:

Does the vehicle have storage or provision for securing multiple helmets when not in use: Yes / No

As people violate rules, the need of the hour is for the 2-wheeler manufacturer to indicate validated quality assurance for different scenarios.

Does the vehicle have a quality tested provision for child to be standing in front? Yes/No

Does the vehicle have a provision for a pillion rider using side-seating? Yes/No

Guidelines that help prevent accidents in two-wheeler

Does the vehicle have a provision for pillion rider using straddle- seating? Yes/No

Does the vehicle have a provision for pillion rider using straddle- seating to secure feet if short or not tall enough? Yes/No

Does the vehicle have a provision for pillion rider to carry loads or child, due to balancing issues? Yes/No

Does the vehicle have a provision to use a carriage facility? Yes/No Does the vehicle have anti-skid tyres to ensure safe rides? Yes/No

Does the vehicle have anti-skid tyres to ensure safe rides? Yes/No

If yes, do these tyres meet the quality expectations of the manufacturer's specifications? Yes/No

Does the vehicle have safety sensors that can stabilize the vehicle for any dangerous speed breaker, dip or hole in road? Yes/No

Guidelines that help prevent accidents in two-wheeler

FYI: Normally, traffic advisories like no overtaking, no sudden turning, no freeway signboards can be put up by the Traffic Control Police on finding that specific roads are affected by dangerous speed breakers, dips or holes

FYI: Requiring 2-wheelers carrying pillion riders or children to keep to a particular side of the road by an authority guided schedule and regulation (though we do not have a lane system) can reduce the accident prone nature seen today.

What can be done to stabilize a vehicle that may have become unstable or imbalanced?

When a 2-wheeler cannot withstand impact with a dangerous speed breaker, dip or hole in the road, the riders and load being carried will fall onto the road, where this may affect other vehicles or cause other vehicles to run into the fallen perimeter.

Securing this perimeter limit may be the need of the hour, but this may not be always possible in congested roads and in heavy traffic conditions.

Ingenuity on the part of the manufacturer, owner or driver of the vehicle to use IoT or Automotive

Electronics sensors

Guidelines that help prevent accidents in two-wheeler

Option 1: The need is to incorporate **lights that start flashing and beeping on both sides of the vehicle** when any imbalance is detected, it is then expected that on such indication that precautionary steps may be taken like vehicles may not overtake or come too close to imbalanced vehicle.

Option 2: The need is to **incorporate lights that start flashing and beeping when any imbalance is detected, where the lights flash on the side that the vehicle will likely fall**, it is then expected that on such indication that precautionary steps may be taken like vehicles may not overtake or come too close to imbalanced vehicle

Added Options like ensuring the use of side cars for 2-wheelers expecting to transport women/children or expecting manufacturers to provide side guard wheels are not fool proof solutions, as the manufactures have to agree and also adhering to the regulation to reduce the length limit, height limit and width limit of categories of vehicles will be the need of tomorrow.

As 2-wheelers are generally used in uncontrolled manners

Does the vehicle have a RTO guided declaration that a safety sign plate would be used to reduce risks? Yes/No

Does the vehicle use a RTO guided safety sign plate while transporting a child or pillion? Yes / No

Guidelines that help prevent accidents in two-wheeler

Option 1: The need is to incorporate **lights that start flashing and beeping on both sides of the vehicle** when any imbalance is detected, it is then expected that on such indication that precautionary steps may be taken like vehicles may not overtake or come too close to imbalanced vehicle.

Option 2: The need is to **incorporate lights that start flashing and beeping when any imbalance is detected, where the lights flash on the side that the vehicle will likely fall**, it is then expected that on such indication that precautionary steps may be taken like vehicles may not overtake or come too close to imbalanced vehicle

Added Options like ensuring the use of side cars for 2-wheelers expecting to transport women/children or expecting manufacturers to provide side guard wheels are not fool proof solutions, as the manufactures have to agree and also adhering to the regulation to reduce the length limit, height limit and width limit of categories of vehicles will be the need of tomorrow.

Guidelines that help prevent accidents in two-wheeler

As 2-wheelers are generally used in uncontrolled manners

Does the vehicle have a RTO guided declaration that a safety sign plate would be used to reduce risks? Yes/No

Does the vehicle use a RTO guided safety sign plate while transporting a child or pillion? Yes / No

Does the vehicle use a RTO guided safety sign plate indicating compliance for helmet requisites? Yes / No

The safety sign plate can be designed by the RTO and the manufacturer(s) associations that coordinate with the RTO to ensure that people are not more accident prone or do not experience case-study based hazards while using their vehicles.

To help record feedback or complaints for any issue with using a vehicle, it may be helpful to use our pull-out Vehicle Related Feedback sheet that follows.



Anti lock Braking System (ABS) - Performance, Information, Components and Systems for NSSR-RS

ABS Performance

Guidelines for safety, driving, and vehicle fitness testing

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

ABS Vehicle Experience

- ☐ **ABS helps safe and effective braking**
- ☐ **ABS improves control over steering during braking**
- ☐ **ABS improves control over vehicle during cornering**
- ☐ **ABS improves tyre life**
- ☐ **ABS reduces fuel consumption**

ABS Maintenance, Repair and Tuning

Guidelines for whether the

[] vehicle needs to be pulled off the road

[] vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

[] ABS Control Module / ABS Hydraulic Modulator

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] ABS Relay

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] ABS Hydraulic Actuator

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] ABS Warning Light

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

ABS Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

☐ ABS Front Wheel Sensors

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ ABS Rear Wheel Sensors

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ ABS Stop Light Switch

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ ABS self-test output

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement



The NSSR-RS programme expects to collect unit specific

- ☐ Feedback
- ☐ Complaints
- ☐ Tickets

from senders of the printed pull-out forms that are duly filled, scanned as e-documents and sent via Whatsapp or Email to the mentioned mobile numbers and ID(s) which will be shared soon



Advanced Rider Assistance Systems (ARAS) –

Performance, Information,
Components and Systems
for NSSR-RS

ARAS Performance

Guidelines for safety, driving, and vehicle fitness testing

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

ARAS Vehicle Experience

- [] ARAS improves safety and enhances rider assistance
- [] ARAS improves riding control in different situations
- [] ARAS enables alerts for Blind spot detection (BSD)
- [] ARAS enables Lane change assistance (LCA) at higher relative speeds
- [] ARAS enables high frequency hazard lights for Rear end collision warning (RCW)
- [] ARAS delivers effective Forward collision warning (FCW)
- [] ARAS enables comfortable, safe distance riding and Adaptive Cruise Control (ACC)

ARAS Maintenance, Repair and Tuning

Guidelines for whether the

[] vehicle needs to be pulled off the road

[] vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

[] ARAS Front RADAR

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] ARAS Rear RADAR

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] ARAS Hazards Lights

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] ARAS Warning Systems / Lane Departure Warning

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

ARAS Maintenance, Repair and Tuning

Guidelines for whether the

[] vehicle needs to be pulled off the road

[] vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

[] ARAS Vehicle Speed Sensors

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] ARAS Throttle Control

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] ARAS Cameras

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Emergency Brake Assist

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

ARAS Maintenance, Repair and Tuning

Guidelines for whether the

[] vehicle needs to be pulled off the road

[] vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

[] Engine Control Unit (ECU)

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Inertial Measurement Unit (IMU)

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Motorcycle Stability Control (MSC)

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Anti-lock Braking System (ABS) / Cornering ABS

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement



Emergency Braking Assist –

Performance, Information,
Components and Systems for
NSSR-RS

EBA Performance

Guidelines for safety, driving, and vehicle fitness testing

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

EBA Vehicle Experience

- ☐ EBA improves safety and control in driving
- ☐ EBA assists braking on collision risk
- ☐ EBA improves safety in sudden and forceful braking
- ☐ EBA reduces stopping distance
- ☐ EBA works effectively in cross traffic situations
- ☐ EBA assists and improves pedestrian safety

EBA Maintenance, Repair and Tuning

Guidelines for whether the

[] vehicle needs to be pulled off the road

[] vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

[] EBA RADARS

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] EBA Cameras

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Vehicle Speed Sensor

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Electronically enabled Braking system/ Emergency Brake Lever

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

EBA Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

☐ Visible/Audible/Haptic Warning Systems

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ EBA Handle-bar Vibration System

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Front and Rear Cross Traffic System / Pedestrian Collision system

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ ECU / ABS

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement



Automatic Headlamp-On (AHO) - Performance, Information, Components and Systems for NSSR-RS

AHO Performance

Guidelines for safety, driving, and vehicle fitness testing

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

AHO Vehicle Experience

- ☐ AHO improves safety and visibility in driving
- ☐ AHO turns on automatically when the engine is started
- ☐ AHO turns off only when the engine stops
- ☐ AHO improves visibility at night, in rain, or in fog or in dusty conditions
- ☐ AHO improves rear view mirror visibility of 2 wheeler and its vehicle information
- ☐ AHO does not drain the battery when ON

AHO Maintenance, Repair and Tuning

Guidelines for whether the

[] vehicle needs to be pulled off the road

[] vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

[] AHO Illuminance Sensors

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] AHO Headlight Console integrated strip

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] AHO Control System/Functions

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] AHO Assembly

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

AHO Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

☐ High-beam button

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Low-beam button

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Pass switch

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Daytime Running Lights

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement



Tyre Pressure Monitoring Systems (TPMS) - Performance, Information, Components and Systems for NSSR-RS

TPMS Performance

Guidelines for safety, driving, and vehicle fitness testing

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

TPMS Vehicle Experience

☐ TPMS improves handling and stability in driving

☐ TPMS alerts when tyre pressure is low

☐ TPMS improves safety by reducing the wear of tyre or incidences of a blow-out / punctured tyre

☐ TPMS improves fuel efficiency

☐ TPMS reduces hydroplaning when an under-inflated tyre loses contact with the road surface in wet conditions

☐ TPMS ensures proper stopping distance

TPMS Maintenance, Repair and Tuning

Guidelines for whether the

[] vehicle needs to be pulled off the road

[] vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

[] TPMS Tyre Pressure Sensors

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] TPMS Warning System/Lamp

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] TPMS Transmission Link

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] TPMS Signal Processor

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

TPMS Maintenance, Repair and Tuning

Guidelines for whether the

[] vehicle needs to be pulled off the road

[] vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

[] TPMS Instrument Panel

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] TPMS Ignition on status

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] TPMS Signal Transmitter / Receiver

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] TPMS Driver Reset

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement



Performance Analysis, Information, Components and Systems for NSSR-RS

(Revisited section as it is important for road safety)

Performance Analysis

Guidelines for safety, driving, and vehicle fitness testing

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

Road Safety Checklist

[] **Protection in normal driving or in an accident (Vehicle ability to withstand Higher shock loads?)**

Condition: Ok/ Needs crash safety planning/Needs maintenance/Needs repair/Needs replacement

[] **Protection in normal driving or in an accident (Visibility related to the – Attention span related Eye position of driver, angle of visibility, spacing for seating, need for rearward visibility?)**

Condition: Ok/ Needs crash safety planning/Needs maintenance/Needs repair/Needs replacement

[] **Protection in an accident (Effect of Collision on the – Front, Rear, sides, sudden tilt, impacted roll over)**

Condition: Ok/ Needs crash safety planning/Needs maintenance/Needs repair/Needs replacement

Performance Analysis

Guidelines for safety, driving, and vehicle fitness testing

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

Road Safety Checklist

☐ **Protection in driving or collision (There should be no items coming loose)**

Condition: Ok/ Needs crash safety planning/Needs maintenance/Needs repair/Needs replacement

☐ **Protection in accident (Hertomatic Flashers and beepers – ignition automatically turning off)**

Condition: Ok/ Needs crash safety planning/Needs maintenance/Needs repair/Needs replacement

☐ **Whether relevant Fire wall separating engine compartment and driver compartment has been incorporated?**

Condition: Ok/ Needs crash safety planning/Needs maintenance/Needs repair/Needs replacement

Performance Analysis

Guidelines for safety, driving, and vehicle fitness testing

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

Road Safety / Fitness Checklist

[] Whether braking system works effectively (for limit of road grip, manoeuvrability, vehicle speed for type of track surface, produces brake pedal pulsations in difficult track conditions)?

Condition: Ok/ Needs crash safety planning/Needs maintenance/Needs repair/Needs replacement

[] Guidelines for possible Engine noises

Condition: Known/ Needs review/Needs maintenance/Needs repair/Needs replacement

[] Guidelines for possible Crank noises

Condition: Known/ Needs review/Needs maintenance/Needs repair/Needs replacement

Performance Analysis

Guidelines for safety, driving, and vehicle fitness testing

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

Road Safety / Fitness Checklist

[] Guidelines for possible **Piston noises**

Condition: Known/ Needs review/Needs maintenance/Needs repair/Needs replacement

[] Guidelines for possible **Valve Train noises**

Condition: Known/ Needs review/Needs maintenance/Needs repair/Needs replacement

[] Guidelines for possible **pre-ignition problems**

Condition: Known/ Needs review/Needs maintenance/Needs repair/Needs replacement

[] Guidelines and **Causes for the Engine to not crank or fully start**

Condition: Known/ Needs review/Needs maintenance/Needs repair/Needs replacement

Performance Analysis

Guidelines for safety, driving, and vehicle fitness testing

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

Road Safety / Fitness Checklist

[] Guidelines for the Engine to crank slowly but does not start

Condition: Known/ Needs review/Needs maintenance/Needs repair/Needs replacement

[] Guidelines for what can cause Excessive smoke (Black)

Condition: Known/ Needs review/Needs maintenance/Needs repair/Needs replacement

[] Guidelines for what can cause Excessive smoke (Blue)

Condition: Known/ Needs review/Needs maintenance/Needs repair/Needs replacement

[] Guidelines for what can cause Excessive smoke (White)

Condition: Known/ Needs review/Needs maintenance/Needs repair/Needs replacement

Performance Analysis

Guidelines for safety, driving, and vehicle fitness testing

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

Road Safety / Fitness Checklist

[] Guidelines for what causes the Loss of coolant

Condition: Known/ Needs review/Needs maintenance/Needs repair/Needs replacement

[] Guidelines for Oil pressure problems (No reading)

Condition: Known/ Needs review/Needs maintenance/Needs repair/Needs replacement

[] Guidelines for Oil pressure problems (low pressure reading)

Condition: Known/ Needs review/Needs maintenance/Needs repair/Needs replacement

[] Guidelines for Oil pressure problems (high pressure reading)

Condition: Known/ Needs review/Needs maintenance/Needs repair/Needs replacement

Performance Analysis

1. Guidelines for possible Engine noises

Tap sound

Rattle sound

Light knocking

Deep knocking

Irregular heavy knocking

Rumble noise

Slapping noise

Vibrating sounds

Clatter noise

Hiss sound

Roar sound

Clunking sound

Whining sound

Shrieking sound

Squealing

Snapping sound on engine overhauling

Starved sound with high speed acceleration noise on starting - Timing belt problems

Source or Cause possibly

Improper adjustment of Valve clearance

Loose or broken components like piston rings

Small end bearings worn out

Big end bearings worn out

Loose fly wheel

Main bearings worn out

Worn out piston or bores

Loose fittings of components

Broken rocker shaft or broken piston rings

Leak from inlet or exhaust manifolds or connections

Air filter malfunctioning noise, Air filter failure

Loose fly wheel, worn out thrust bearing, loose damper pulley

Malfunction in power steering or alternate bearings

Dry bearings in ancillary components

Slipping drive belt

Tight fitting of piston rings

2. Guidelines for possible Crank noises

Source or Cause possibly

Excessive clearance in main bearings

Main journals out of alignment

Excessive axial play in crank shaft

Low oil pressure

Unbalanced crank shaft

Loose fly wheel

Loose fitting of main journals and main bearing caps

Improper seating of thrust bearings

Loose damper pulley

Excessive play in main journal bearings

Timing belt problems

3. Guidelines for possible Piston noises (sharp noises while at idling speed)

Source or Cause possibly

Excessive side clearance

Loose fitting in small end bearing

Bent connecting rod

More clearance between piston pin and boss

Performance Analysis

4. Guidelines for possible Valve Train Noise

Source or Cause possibly

- Improper adjustment of valve clearance
- Bent push rod
- Worn out rocker arm and valve tip
- Warped valve
- Carbonized or scored valve stems
- Excessive clearance between valve stem and valve guide
- Worn out or broken valve spring
- Improper valve timing
- Worn out cam lobes
- Broken or damaged valve lifter
- Loose fitting of adjustment screw and nut for valve tappet clearance

5. Guidelines for Pre-ignition problems (deposits in combustion chambers and/or on spark plugs)

Experience - poor acceleration, engine roughness and reduced top speed Source or Cause possibly

- Clogging of carburettor jets
- Improper idling
- Loose fitting of spark plugs
- Improved driving / Maintaining constant speed when possible

6. Guidelines for Causes for the Engine to not crank or fully start

Source or Cause possibly

- Defective starting motor
- Defective battery
- Loose connection of battery wire and starting motor wire
- Fly wheel problem needing servicing
- Worn out teeth of fly wheel
- Slow running of armature shaft
- Timing belt problems

7. Guidelines for the Causes for the Engine to crank slowly but does not start

Source or Cause possibly

- Defective fuel pump
- Fuel line blocked
- Fuel filter blocked
- Defective Fuel pump
- Air lock or air may be present in fuel line
- Less Fuel in tank
- Air cleaner blocked
- Defective fuel injector
- Worn out valves and springs in pump
- What can cause Over heating of engine Source or Cause possibly
- Loose fan belt
- Radiator blocked or surface area reduction
- Radiator tubes blocked
- Improper opening of thermostat valve
- Hose pipes blocked
- Coolant pump malfunctioning
- Coolant jackets and hoses may be clogged
- Head gasket seating improper
- Coolant level low
- Leakage of coolant from radiator
- Early or late ignition problem
- Clutch slipping
- Brake jamming or drag
- Tight wheel bearings

Performance Analysis

8. Guidelines for what can cause Excessive smoke (Black)

Source or Cause possibly

- Choked Air filter
- Fuel injection pump not properly calibrated
- Defective injector
- Defective governor diaphragm
- Incorrect valve clearance
- Poor compression

9. Guidelines for what can cause Excessive smoke (Blue)

Source or Cause possibly

- Sticky or broken piston rings
- Worn out cylinder bores
- Weak compression
- Oil level in oil sump not proper
- Mixing of lubricating oil with fuel
- Improper grade engine oil
- Improper grade lubricating oil

10. Guidelines for what can cause Excessive smoke (White)

Source or Cause possibly

- Defective valve seating
- Fuel injection pump not properly calibrated
- Delay between injection and combustion of fuel
- More unburnt fuel
- Low operating temperature

11. Guidelines for what causes the Loss of coolant

Source or Cause possibly

- Radiator leakage
- Hose pipe leakage
- Loose drain plug or drain plug leakage
- Oil seal damaged for pump
- Leaky or faulty head gasket
- Damaged or cracked pump casing
- Improper or Loose or damaged thermostat or valve packing
- Faulty or missing radiator cap
- Crack in cylinder block
- Engine overheating

12. Guidelines for Oil pressure problems (No reading)

Source or Cause possibly

- No oil in sump or reservoir
- Oil gauge not functioning properly
- Faulty oil pump
- Faulty valve or valve spring
- Loose connection or Faulty pressure gauge
- Leakage of oil

13. Guidelines for Oil pressure problems (low pressure reading)

Source or Cause possibly

- Less oil in sump or reservoir
- Oil Filter clogged
- Faulty or worn out oil pump
- Faulty or broken valve spring
- Faulty or slack main bearings
- Leakage of oil

Performance Analysis

14. Guidelines for Oil pressure problems (high pressure reading)

Source or Cause possibly

Oil lines clogged
Faulty or broken valve
Faulty or defective pressure gauge
High viscosity or improper grade oil

Fuel consumption checklist for a driver or owner (mileage and emission level influencer)

Date of response:

Time of response:

Do you idle your engine on a cold-start: Yes/No/Sometimes/Not applicable

Do you ensure your engine's idling speed is right or get this addressed whenever you can: Yes/No/Sometimes/Not applicable

Do you switch off your engine whenever not required or at halt times more than 1 minute: Yes/No/Sometimes/Not applicable

Do you address problems like engine overheating as soon as you can: Yes/No/Sometimes/Not applicable

Do you avoid changing gears often by speed control or by choosing right routes and lanes: Yes/No/Sometimes/Not applicable

Do you immediately address any problem with the flow of fuel or the functioning of the carburetor in your vehicle as soon as you can: Yes/No/Sometimes/Not applicable

Do you avoid using or switch off your vehicle's air-conditioner whenever you can: Yes/No/Sometimes/ Not applicable

Do you ask for recommendations from your service outlet for maintenance of good condition and mileage: Yes/No/Sometimes/Not applicable

Performance Analysis

Guidelines for safety, driving, and vehicle fitness testing

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

Performance Tuning List (ICE)

☐ **Engine sound and running check**

Condition; Ok/ Needs tuning/Needs maintenance/Needs repair/Needs replacement

☐ **Exhaust smoke check**

Condition; Ok/ Needs tuning/Needs maintenance/Needs repair/Needs replacement

☐ **Oil leak while idling or while running check**

Condition; Ok/ Needs tuning/Needs maintenance/Needs repair/Needs replacement

Performance Analysis

Performance Tuning List (ICE)

[] Noise conditions check (engine accessories, gears, bearings, suspension, drive line, tyres)

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Vibrations check (constant velocity joints, drive shafts, transmission mountings, suspension components, wheel bearings, brakes)

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] On-road check at normal driving speeds / high speeds (Acceleration or deceleration, lack of power output, excessive oil consumption, excessive fuel consumption, noise and vibration at turning, engine rpm thresholds)

Condition; Ok/Problematic but will function/Needs top-up or refilling/Needs replacement

Performance Analysis

Performance Tuning List (ICE)

- ☐ Test Drive **Safety check at normal driving speeds / high speeds (Acceleration or deceleration, lack of power output, excessive oil consumption, excessive fuel consumption, noise and vibration at turning, engine rpm thresholds)**

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

Specific to (Lack of power output)

- ☐ Low compression

Remedy: Overhaul engine/Replace parts as necessary

- ☐ Late ignition timing

Remedy: Adjust ignition timing and check engine running

- ☐ Improper functioning of carburetor and fuel pump

Remedy: Service carburetor or fuel pump properly and check engine running

Performance Analysis

Performance Tuning List (ICE) - Specific to (Lack of power output)

☐ Air cleaner clogged or blocked

Remedy: Clean or clear clogs/Replace if necessary

☐ Fuel lining clogged or blocked

Remedy: Clear clogged lines/Replace if necessary

☐ Engine temperature high

Remedy: Service cooling system/Replace as necessary

☐ Improper tappet clearance

Remedy: Adjust tappet clearance as in specification or as required/Replace parts as necessary

☐ Faulty valve timing or late valve timing

Remedy: Service valve/Adjust valve timing/Replace parts as necessary

Performance Analysis

Performance Tuning List (ICE)- Specific to (Lack of power output)

☐ Leaky gasket

Remedy: Replace gasket

☐ Muffler clogged or bent exhaust pipe

Remedy: Clean the muffler/straighten the exhaust pipe/Replace parts as necessary

Performance Analysis

Performance Tuning List (ICE) - Specific to (Excessive fuel consumption in ICE models)

[] Idling may be incorrect

Remedy: Adjust idling speed and check engine running

[] Air filter choked

Remedy: Clean properly/ Filament replacement

[] Clogged air bleeds and jets in carburettor

Remedy: Service carburettor properly/ Replace as necessary

[] Dysfunction of needle valve in carburettor

Remedy: Clean valve properly/ Replace as necessary

Performance Analysis

Performance Tuning List (ICE) - Specific to (Excessive fuel consumption in ICE models)

☐ Clutch lever linkage improperly adjusted

Remedy: Adjust properly

☐ Float punctured or damaged

Remedy: Replace float

☐ Float level improperly adjusted

Remedy: Adjust properly

☐ Fuel pump pressure too high

Remedy: Adjust properly by placing packing in seating

☐ Metering rod improper adjustment or worn out

Remedy: Adjust properly/ Replace as necessary

Performance Analysis

Performance Tuning List (ICE)- Specific to (Excessive oil consumption)

☐ Improper grade of oil used

Remedy: Use oil of standard quality and grade

☐ Leakage from oil sump/drain plug/crank case seating/joint packing/oil filter seating or packing

Remedy: Tighten properly/Needs repair/Needs replacement

☐ Leakage of oil from combustion chamber due to worn out piston rings or cylinder walls

Remedy: Overhauling/ Needs piston ring replacement

☐ Leakage from fuel pump seating, gear cover

Remedy: Tighten properly/ Replace packing

☐ Check holes of ring slots

Remedy: Remove pistons and piston rings & clean properly/ Replace as necessary

Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

Maintenance, Repair and Tuning List (ICE)

☐ Abnormal noise check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Maintenance, Repair and Tuning List (ICE)

☐ Air filter check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Battery electrolyte level check

Condition; Ok/Problematic but will function/Needs top-up or refilling/Needs replacement

☐ Blinkers, bulbs and head lamps check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Bolts and Nuts tightening check (engine specific)

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

Maintenance, Repair and Tuning

Guidelines for whether the

[] vehicle needs to be pulled off the road

[] vehicle needs cost effective repairs to be on-road

Maintenance, Repair and Tuning List (ICE)

[] Bolts and Nuts tightening check (front and rear shock absorbers)

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Bolts and Nuts tightening check (front and rear tyres)

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Brake fluid level check

Condition; Ok/Problematic but will function/Needs top-up or refilling/Needs replacement

[] Brake disc condition check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Maintenance, Repair and Tuning List (ICE)

☐ Brake drum and lining check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Brake liners or pads check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Carburettor check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Maintenance, Repair and Tuning List (ICE)

☐ Chassis or body condition check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Clutch Pedal Play

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Coolant level check

Condition; Ok/Problematic but will function/Needs top-up or refilling/Needs replacement

☐ Differential oil check

Condition; Ok/Problematic but will function/Needs top-up or refilling/Needs replacement

Maintenance, Repair and Tuning

Guidelines for whether the

[] vehicle needs to be pulled off the road

[] vehicle needs cost effective repairs to be on-road

Maintenance, Repair and Tuning List (ICE)

[] Drive belts tension check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Drive shafts check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Engine oil level check

Condition; Ok/Problematic but will function/Needs top-up or refilling/Needs replacement

[] Entire electricity cables and connections check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Maintenance, Repair and Tuning List

☐ Exhaust system check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Fuel Lines Pipes Leakage check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Fuse box and fuses check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Gear Box oil check

Condition; Ok/Problematic but will function/Needs top-up or refilling/Needs replacement

Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Maintenance, Repair and Tuning List (ICE)

☐ Hoses, clamps and pipes check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Idling and proper acceleration check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Lubrication chart check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Power steering oil check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Maintenance, Repair and Tuning List (ICE)

☐ Seat and seat bolts check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Steering mechanism and play check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Suspension front and rear check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Tappet or Valve Lifter clearance check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Maintenance, Repair and Tuning List (ICE)

☐ Transmission oil check

Condition; Ok/Problematic but will function/Needs top-up or refilling/Needs replacement

☐ Front Wheel and Rear Wheel axle check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Tyre condition check (rotate if necessary)

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Tyre pressure check

Condition; Ok/Problematic but will function/Needs refilling/Needs replacement

Maintenance, Repair and Tuning

Guidelines for whether the

[] vehicle needs to be pulled off the road

[] vehicle needs cost effective repairs to be on-road

Maintenance, Repair and Tuning List (ICE)

[] Cranking/engine sound check while being started (rotate if necessary)

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Universal joints and slip joints check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Vehicle pulling, Front wheel / Rear wheel wobbling check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Alignment and balancing check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (EV/Hybrid)

☐ Battery Check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Brakes / Regenerative Brakes Check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Electric Propulsion System Check / Motor Drives Check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Switched Reluctance Motor Drives/Induction Motor Drives/Gearing/ Differential Check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Power Flow Control / Vehicle Control Unit

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

Maintenance, Repair and Tuning

Guidelines for whether the

[] vehicle needs to be pulled off the road

[] vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (EV/Hybrid)

[] EV Chargers

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] EV Subsystems

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

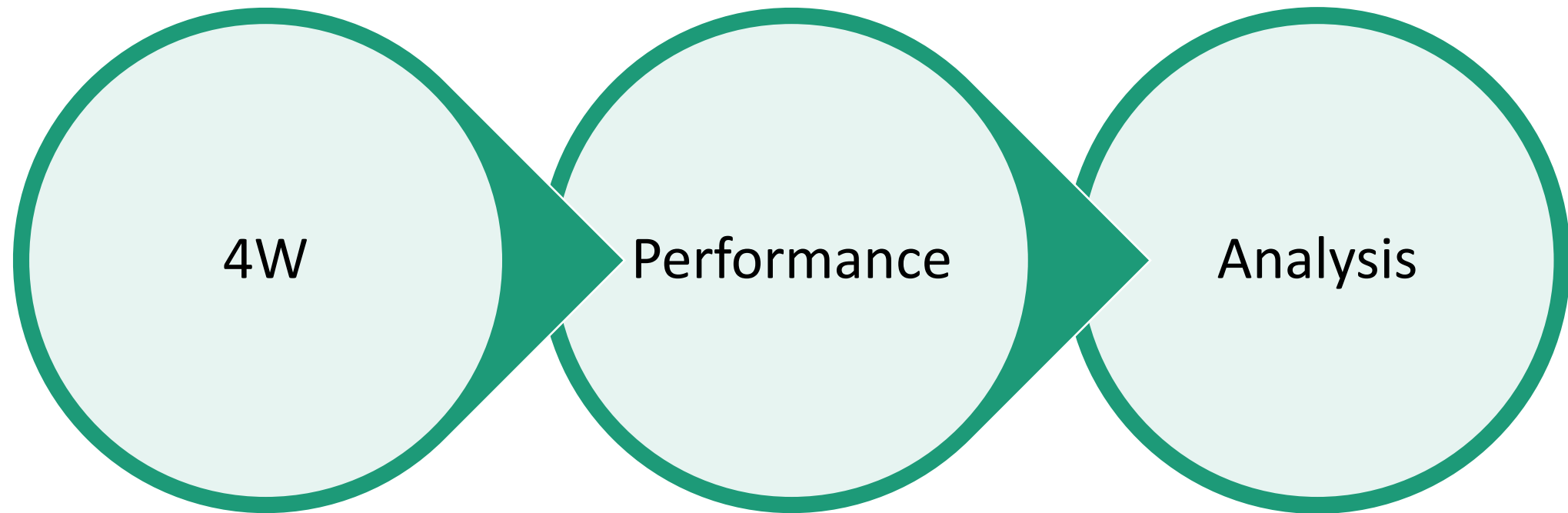
[] Accelerator Check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Steering Handle Check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

(Road Safety/Support Planner)





Anti lock Braking System (ABS) - Performance, Information, Components and Systems for NSSR-RS

(Revisited section as it is important for road safety)

ABS Performance

Guidelines for safety, driving, and vehicle fitness testing

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

ABS Vehicle Experience

- ☐ **ABS helps safe and effective braking**
- ☐ **ABS improves control over steering during braking**
- ☐ **ABS improves control over vehicle during cornering**
- ☐ **ABS improves tyre life**
- ☐ **ABS reduces fuel consumption**

ABS Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

☐ ABS Control Module / ABS Hydraulic Modulator

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ ABS Relay

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ ABS Hydraulic Actuator

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ ABS Warning Light

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

ABS Maintenance, Repair and Tuning

Guidelines for whether the

[] vehicle needs to be pulled off the road

[] vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

[] ABS Front Wheel (Right and Left Sensors)

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] ABS Rear Wheel Right and Left Sensors)

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] ABS Stop Light Switch

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] ABS self-test output

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement



Traction Control System (TCS) - Performance, Information, Components and Systems for NSSR-RS

TCS Performance

Guidelines for safety, driving, and vehicle fitness testing

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

TCS Vehicle Experience

☐ TCS helps improve contact between the road surface and tyres

☐ TCS helps control unwanted wheel spin

☐ TCS improves control over engine speed and torque

☐ TCS helps vehicle regain grip on skidding

TCS Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

☐ TCS Control Module / TCS Hydraulic Modulator

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ TCS Control Module

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ TCS Pump assembly

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ TCS Wheel Speed sensor

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

TCS Maintenance, Repair and Tuning

Guidelines for whether the

[] vehicle needs to be pulled off the road

[] vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

[] TCS Throttle Position Sensor

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] TCS Throttle Position module Buffer Box

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Throttle Cables

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Throttle Cable Relaxer Motor

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement



Electronic Stability Control (ESC) - Performance, Information, Components and Systems for NSSR-RS

ESC Performance

Guidelines for safety, driving, and vehicle fitness testing

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

ESC Vehicle Experience

☐ ESC helps improve stable driving in all directions

☐ ESC improves lateral movement when there can be a difference between the steering input and experienced vehicle movement / direction

☐ ESC improves intervention (in braking and/or in accelerating of driven wheels)

☐ ESC prevents skidding

☐ ESC helps in Hill Control

☐ ESC helps Hydraulic Brake Assist

☐ ESC helps Roll Over Mitigation

ESC Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

☐ ESC Control Module

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ TCS Control Module

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ ESC brake intervention actuator

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ ESC engine intervention actuator

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

ESC Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

☐ ESC Wheel Speed Sensor

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ ESC Steering Angle sensor

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ ESC Yaw-rate sensor

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ ESC lateral-acceleration sensor

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement



Airbag System (SRS) - Performance, Information, Components and Systems for NSSR-RS

Airbag Performance

Guidelines for safety, driving, and vehicle fitness testing

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

Airbag or Supplementary Restraint System in-Vehicle Experience

- ☐ The Airbag or SRS is the Accelerometer type
- ☐ The Airbag or SRS is the Inertia Switch type
- ☐ The Airbag or SRS helps protect the driver and occupants at the time of a collision
- ☐ The Airbag or SRS reduces impact to the driver's chest and face with the steering wheel
- ☐ The Airbag or SRS reduces impact of the co-driver / passenger with the dashboard
- ☐ The sideways Airbags or SRS reduces sideways impact to the upper body and head
- ☐ The Driver side Airbag or SRS is fitted appropriately to the centre of the steering wheel
- ☐ The Co-driver / Passenger side Airbag or SRS is fitted at the dashboard appropriately

Airbag Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

☐ Airbag Module

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Crash Sensors in the engine compartment

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Crash Sensors in the passenger compartment

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Diagnostic Module that monitors the components and wiring harness

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

Airbag Maintenance, Repair and Tuning

Guidelines for whether the

[] vehicle needs to be pulled off the road

[] vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

[] Pyrotechnic seat belt tightening system

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Airbag ignitor that releases chemicals (Zeronic Potassium Perchlorate) to inflate the airbag

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Clock spring that ensures connection to the air bag even when the steering wheel is turned

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Airbag malfunction warning light

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

Zeronic Potassium Perchlorate: combination of sodium azide and copper oxide that releases Nitrogen gas on being ignited



Collision Avoidance Warning System (CAWS) - Performance, Information, Components and Systems for NSSR-RS

CAWS Performance

Guidelines for safety, driving, and vehicle fitness testing

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

Collision Avoidance Warning System in-Vehicle Experience

- [] The Radar calculates the distance between the vehicle and moving object
- [] The Visual warning system helps avoid potential collision with the moving object
- [] The Audio warning system helps avoid potential collision with the moving object
- [] The Timing circuit and pulse generator correctly generates pulses to detect collision possibility
- [] The Timing circuit and pulse generator correctly measures distance to the moving object
- [] The Timing circuit and pulse generator correctly measures the speed or velocity

CAWS Maintenance, Repair and Tuning

Guidelines for whether the

[] vehicle needs to be pulled off the road

[] vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

[] Low power radar system

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Radar (transmitting and receiving) antenna mounted in the front of the vehicle

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Timing circuit and Pulse generator

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Microwave oscillator and modulator

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

CAWS Maintenance, Repair and Tuning

Guidelines for whether the

[] vehicle needs to be pulled off the road

[] vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

[] Frequency Difference Amplifier

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Mixer that mixes antenna input with oscillator signal

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Pulse recovery system

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Signal Interference measurement system

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement



Autonomous Intelligence Cruise Control (AICC) - Performance, Information, Components and Systems for NSSR-RS

AICC Performance

Guidelines for safety, driving, and vehicle fitness testing

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

Autonomous Intelligence Cruise Control in-Vehicle Experience

- ☐ The AICC maintains speed set by the driver
- ☐ The AICC intelligently controls speed to maintain a safe distance from the object moving in front
- ☐ The AICC warning system helps avoid potential collision with the moving object
- ☐ The AICC correctly measures the distance / range of vehicle
- ☐ The AICC correctly measures the speed or velocity
- ☐ The AICC maintains speed in traffic
- ☐ The AICC maintains a safe following distance

AICC Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

☐ Vehicle Speed sensor

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Headway sensor (radar or lidar) mounted in the front of the vehicle

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Throttle position control sensor

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Steering angle sensor

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

AICC Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

☐ Brake Actuator

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ AICC related ECU

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Interference Filter module, Analog to Digital Converter, Fourier Transformation unit, Signal processing system

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Detector, (Visual and Audio) Warning systems

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement



Electronic Suspension Control System (ESC+) - Performance, Information, Components and Systems for NSSR-RS

ESC+ Performance

Guidelines for safety, driving, and vehicle fitness testing

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

Electronic Suspension Control System in-Vehicle Experience

- ☐ The ESC+ improves drive/ride comfort
- ☐ The ESC+ reduces fatigue causing conditions for driver and passenger
- ☐ The ESC+ improves ride and handling of the vehicle
- ☐ The ESC+ reduces risk of pitching, rolling or bouncing of the vehicle
- ☐ The ESC+ correspondingly varies the shock damping to suit the road condition
- ☐ The ESC+ maintains constant height / damping of vehicle reducing the need to adjust headlights etc
- ☐ The ESC+ uses active suspension (outside and inside) actuators for moving in turns

ESC+ Maintenance, Repair and Tuning

Guidelines for whether the

[] vehicle needs to be pulled off the road

[] vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

[] ESC Control module input sensors

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] ESC Control module

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] ESC control for spring setting

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] ESC control for shock damping

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

ESC+ Maintenance, Repair and Tuning

Guidelines for whether the

[] vehicle needs to be pulled off the road

[] vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

[] ESC+ Outside Actuators for better turning experiences

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] ESC+ Inside Actuators for better turning experiences

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] ESC Vehicle position and Accelerometer sensors

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] ESC Front (Left and Right) Struts, Rear (Left and Right) shock absorbers

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement



Electronic Locking Differential (ELD) - Performance, Information, Components and Systems for NSSR-RS

ELD Performance

Guidelines for safety, driving, and vehicle fitness testing

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

Electronic Locking Differential in-Vehicle Experience

- ☐ The ELD locks the speed of both the wheels on an axle
- ☐ The ELD reduces slack in any traction due to different speeds of the wheels on an axle
- ☐ The ELD improves power felt and handling of the vehicle
- ☐ The ELD distributes the torque evenly across the wheels of the vehicle
- ☐ The ELD reduces risk of wheel spin, pitching, rolling or bouncing of the vehicle

ELD Maintenance, Repair and Tuning

Guidelines for whether the

[] vehicle needs to be pulled off the road

[] vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

[] ELD ECU Control module

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] ELD driver actuator

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] TCS Hydraulic Modulator/ ELD Torque Transfer Assembly

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] ELD locking mechanism / Clutch Assembly

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

ELD Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

☐ ELD Wheel Speed Sensor

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ ELD Differential housing

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ ELD Ring gear

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ ELD Pinion gear

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement



Trail Control (TC) - Performance, Information, Components and Systems for NSSR-RS

TC Performance

Guidelines for safety, driving, and vehicle fitness testing

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

Trail Control in-Vehicle Experience

☐ Trail control enables cruise control at low speeds and in off-road conditions

☐ Trail control helps the driver focus on braking instead of braking and accelerating during difficult driving conditions

☐ Trail Control helps set the speed of the vehicle

☐ Trail Control uses 4-wheel drive modes

☐ Trail Control works with the Terrain Management System for different terrains, hills, slopes, obstacles

TC Maintenance, Repair and Tuning

Guidelines for whether the

[] vehicle needs to be pulled off the road

[] vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

[] TC ECU Control module

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] TC Hydraulic Modulator

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] TC Motion Controller

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] TC Wheel Speed Sensor

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

TC Maintenance, Repair and Tuning

Guidelines for whether the

[] vehicle needs to be pulled off the road

[] vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

[] TC Actuators/Encoders

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] TC Position/Speed/Acceleration Sensors

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] TC Proximity Sensor

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] TC Steering Angle Sensor

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] TC Dashboard Indicator

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement



Blindspot Information System (BSIS) - Performance, Information, Components and Systems for NSSR-RS

BSIS Performance

Guidelines for safety, driving, and vehicle fitness testing

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

Blind spot Information System-Vehicle Experience

- ☐ BSIS helps in blind spot monitoring and warning
- ☐ BSIS helps in conflicting turn signal conditions
- ☐ BSIS helps warn to prevent accidents during a lane change or merge
- ☐ BSIS improves driver confidence
- ☐ BSIS reduces accidents in different terrains, hills, slopes, obstacles
- ☐ BSIS helps cross traffic conditions
- ☐ BSIS helps coordinate trailer attachment

BSIS Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

☐ BSIS ECU Control module

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ BSIS Radar Sensors/ Ultrasonic Sensors

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ BSIS Warning indicators (Visual/Audio/Haptic)

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ NSIS Rear and Side Cameras

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

BSIS Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

☐ Rear Cross Traffic Alert

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ BSIS Steering Control Module

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ BSIS Braking Control Module

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement



Exterior Lighting Control (ELC) - Performance, Information, Components and Systems for NSSR-RS

ELC Performance

Guidelines for safety, driving, and vehicle fitness testing

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

External Lighting Control-Vehicle Experience

- ☐ ELC helps coordinate exterior lights control
- ☐ ELC helps visibility in conflicting daylight conditions
- ☐ ELC dashboard help warn to prevent accidents
- ☐ ELC reduces accidents in different driving conditions

ELC Maintenance, Repair and Tuning

Guidelines for whether the

[] vehicle needs to be pulled off the road

[] vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

[] ELC Control module

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] ELC Headlights Sensor/module

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] ELC Tail Lights Sensor/module

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] ELC Auto Lamp Sensor/module

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

ELC Maintenance, Repair and Tuning

Guidelines for whether the

[] vehicle needs to be pulled off the road

[] vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

[] ELC Ambient Cabin Lighting Sensor/module

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] ELC Exterior Zone Lighting / Corner Lamps Sensor/module

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] ELC Parking Lamp Sensor/module

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] ELC Dashboard Indicator

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement



Parking Assist System/Technology (PAS) - Performance, Information, Components and Systems for NSSR-RS

PAS Performance

Guidelines for safety, driving, and vehicle fitness testing

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

Parking Assist System-Vehicle Experience

- ☐ PAS helps park without stress and risk
- ☐ PAS helps in parallel parking conditions
- ☐ PAS helps in perpendicular parking conditions
- ☐ PAS helps in limited space parking conditions
- ☐ PAS detects obstacles in parking
- ☐ PAS provides guided instructions during each step of parking

PAS Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

☐ PAS Control module

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ PAS Ultrasonic Sensors

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ PAS Visual Perspective Cameras

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ PAS Feedback Control module

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

PAS Maintenance, Repair and Tuning

Guidelines for whether the

[] vehicle needs to be pulled off the road

[] vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

[] PAS Steering Assist module

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] PAS Braking Assist module

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] PAS vehicle position / spot detection module

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] PAS infotainment software updates

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement



Child Restraint System (CRS) - Performance, Information, Components and Systems for NSSR-RS

CRS Performance

Guidelines for safety, driving, and vehicle fitness testing

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

Child Restraint System-Vehicle Experience

- ☐ The CRS includes a seat
- ☐ The CRS includes straps
- ☐ The CRS includes securing buckles
- ☐ The CRS includes adjusting devices / functions
- ☐ The CRS helps protect the child at the time of a collision
- ☐ The CRS is of the right group (that is Group as per safety law)

Group 0: for children of a mass less than 10 kg

Group 0+: for children of a mass less than 13 kg

Group I: for children of mass from 9 kg to 18 kg

Group II: for children of mass from 15 kg to 25 kg

Group III: for children of mass from 22 kg to 36 kg

CRS Maintenance, Repair and Tuning

Guidelines for whether the

[] vehicle needs to be pulled off the road

[] vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

[] CRS Group selection and Installation

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] CRS Passive Safety Functioning (for collision/crash/abrupt deceleration)

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] CRS Seat

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] CRS Seat Belt / Straps

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

CRS Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

☐ CRS Securing Buckles

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ CRS Adjusting devices

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ CRS Supplementary Attachments

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ CRS Impact Shield

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement



Performance Analysis, Information, Components and Systems for NSSR-RS

(Revisited section as it is important for road safety)

Performance Analysis

Guidelines for safety, driving, and vehicle fitness testing

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

Road Safety Checklist

[] Protection in normal driving or in an accident (Vehicle ability to withstand Higher shock loads?)

Condition: Ok/ Needs crash safety planning/Needs maintenance/Needs repair/Needs replacement

[] Protection in normal driving or in an accident (Visibility related to the – Eye position of driver, angle of visibility, spacing for seating, need for rearward visibility?)

Condition: Ok/ Needs crash safety planning/Needs maintenance/Needs repair/Needs replacement

[] Protection in an accident (Effect of Collision on the – Front, Rear, sides, sudden tilt, impacted roll over)

Condition: Ok/ Needs crash safety planning/Needs maintenance/Needs repair/Needs replacement

Performance Analysis

Guidelines for safety, driving, and vehicle fitness testing

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

Road Safety Checklist

☐ **Protection in driving or collision (There should be no items coming loose)**

Condition: Ok/ Needs crash safety planning/Needs maintenance/Needs repair/Needs replacement

☐ **Protection in accident (Hertomatic Flashers and beepers – ignition automatically turning off)**

Condition: Ok/ Needs crash safety planning/Needs maintenance/Needs repair/Needs replacement

☐ **Whether relevant Fire wall separating engine compartment and driver compartment has been incorporated?**

Condition: Ok/ Needs crash safety planning/Needs maintenance/Needs repair/Needs replacement

Performance Analysis

Guidelines for safety, driving, and vehicle fitness testing

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

Road Safety / Fitness Checklist

[] Whether braking system works effectively (for limit of road grip, manoeuvrability, vehicle speed for type of track surface, produces brake pedal pulsations in difficult track conditions)?

Condition: Ok/ Needs crash safety planning/Needs maintenance/Needs repair/Needs replacement

[] **Guidelines for possible Engine noises**

Condition: Known/ Needs review/Needs maintenance/Needs repair/Needs replacement

[] **Guidelines for possible Crank noises**

Condition: Known/ Needs review/Needs maintenance/Needs repair/Needs replacement

Performance Analysis

Guidelines for safety, driving, and vehicle fitness testing

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

Road Safety / Fitness Checklist

[] Guidelines for possible **Piston noises**

Condition: Known/ Needs review/Needs maintenance/Needs repair/Needs replacement

[] Guidelines for possible **Valve Train noises**

Condition: Known/ Needs review/Needs maintenance/Needs repair/Needs replacement

[] Guidelines for possible **pre-ignition problems**

Condition: Known/ Needs review/Needs maintenance/Needs repair/Needs replacement

[] Guidelines and **Causes for the Engine to not crank or fully start**

Condition: Known/ Needs review/Needs maintenance/Needs repair/Needs replacement

Performance Analysis

Guidelines for safety, driving, and vehicle fitness testing

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

Road Safety / Fitness Checklist

[] Guidelines for the Engine to crank slowly but does not start

Condition: Known/ Needs review/Needs maintenance/Needs repair/Needs replacement

[] Guidelines for what can cause Excessive smoke (Black)

Condition: Known/ Needs review/Needs maintenance/Needs repair/Needs replacement

[] Guidelines for what can cause Excessive smoke (Blue)

Condition: Known/ Needs review/Needs maintenance/Needs repair/Needs replacement

[] Guidelines for what can cause Excessive smoke (White)

Condition: Known/ Needs review/Needs maintenance/Needs repair/Needs replacement

Performance Analysis

Guidelines for safety, driving, and vehicle fitness testing

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

Road Safety / Fitness Checklist

[] Guidelines for what causes the Loss of coolant

Condition: Known/ Needs review/Needs maintenance/Needs repair/Needs replacement

[] Guidelines for Oil pressure problems (No reading)

Condition: Known/ Needs review/Needs maintenance/Needs repair/Needs replacement

[] Guidelines for Oil pressure problems (low pressure reading)

Condition: Known/ Needs review/Needs maintenance/Needs repair/Needs replacement

[] Guidelines for Oil pressure problems (high pressure reading)

Condition: Known/ Needs review/Needs maintenance/Needs repair/Needs replacement

Performance Analysis

1. Guidelines for possible Engine noises

Tap sound

Rattle sound

Light knocking

Deep knocking

Irregular heavy knocking

Rumble noise

Slapping noise

Vibrating sounds

Clatter noise

Hiss sound

Roar sound

Clunking sound

Whining sound

Shrieking sound

Squealing

Snapping sound on engine overhauling

Starved sound with high speed acceleration noise on starting - Timing belt problems

Source or Cause possibly

Improper adjustment of Valve clearance

Loose or broken components like piston rings

Small end bearings worn out

Big end bearings worn out

Loose fly wheel

Main bearings worn out

Worn out piston or bores

Loose fittings of components

Broken rocker shaft or broken piston rings

Leak from inlet or exhaust manifolds or connections

Air filter malfunctioning noise, Air filter failure

Loose fly wheel, worn out thrust bearing, loose damper pulley

Malfunction in power steering or alternate bearings

Dry bearings in ancillary components

Slipping drive belt

Tight fitting of piston rings

Timing belt problems

2. Guidelines for possible Crank noises

Source or Cause possibly

Excessive clearance in main bearings

Main journals out of alignment

Excessive axial play in crank shaft

Low oil pressure

Unbalanced crank shaft

Loose fly wheel

Loose fitting of main journals and main bearing caps

Improper seating of thrust bearings

Loose damper pulley

Excessive play in main journal bearings

Timing belt problems

3. Guidelines for possible Piston noises (sharp noises while at idling speed)

Source or Cause possibly

Excessive side clearance

Loose fitting in small end bearing

Bent connecting rod

More clearance between piston pin and boss

Performance Analysis

4. Guidelines for possible Valve Train Noise

Source or Cause possibly

- Improper adjustment of valve clearance
- Bent push rod
- Worn out rocker arm and valve tip
- Warped valve
- Carbonized or scored valve stems
- Excessive clearance between valve stem and valve guide
- Worn out or broken valve spring
- Improper valve timing
- Worn out cam lobes
- Broken or damaged valve lifter
- Loose fitting of adjustment screw and nut for valve tappet clearance

5. Guidelines for Pre-ignition problems (deposits in combustion chambers and/or on spark plugs)

Experience - poor acceleration, engine roughness and reduced top speed Source or Cause possibly

- Clogging of carburettor jets
- Improper idling
- Loose fitting of spark plugs
- Improved driving / Maintaining constant speed when possible

6. Guidelines for Causes for the Engine to not crank or fully start

Source or Cause possibly

- Defective starting motor
- Defective battery
- Loose connection of battery wire and starting motor wire
- Fly wheel problem needing servicing
- Worn out teeth of fly wheel
- Slow running of armature shaft
- Timing belt problems

7. Guidelines for the Causes for the Engine to crank slowly but does not start

Source or Cause possibly

- Defective fuel pump
- Fuel line blocked
- Fuel filter blocked
- Defective Fuel pump
- Air lock or air may be present in fuel line
- Less Fuel in tank
- Air cleaner blocked
- Defective fuel injector
- Worn out valves and springs in pump
- What can cause Over heating of engine Source or Cause possibly
- Loose fan belt
- Radiator blocked or surface area reduction
- Radiator tubes blocked
- Improper opening of thermostat valve
- Hose pipes blocked
- Coolant pump malfunctioning
- Coolant jackets and hoses may be clogged
- Head gasket seating improper
- Coolant level low
- Leakage of coolant from radiator
- Early or late ignition problem
- Clutch slipping
- Brake jamming or drag
- Tight wheel bearings

Performance Analysis

8. Guidelines for what can cause Excessive smoke (Black)

Source or Cause possibly

- Choked Air filter
- Fuel injection pump not properly calibrated
- Defective injector
- Defective governor diaphragm
- Incorrect valve clearance
- Poor compression

9. Guidelines for what can cause Excessive smoke (Blue)

Source or Cause possibly

- Sticky or broken piston rings
- Worn out cylinder bores
- Weak compression
- Oil level in oil sump not proper
- Mixing of lubricating oil with fuel
- Improper grade engine oil
- Improper grade lubricating oil

10. Guidelines for what can cause Excessive smoke (White)

Source or Cause possibly

- Defective valve seating
- Fuel injection pump not properly calibrated
- Delay between injection and combustion of fuel
- More unburnt fuel
- Low operating temperature

11. Guidelines for what causes the Loss of coolant

Source or Cause possibly

- Radiator leakage
- Hose pipe leakage
- Loose drain plug or drain plug leakage
- Oil seal damaged for pump
- Leaky or faulty head gasket
- Damaged or cracked pump casing
- Improper or Loose or damaged thermostat or valve packing
- Faulty or missing radiator cap
- Crack in cylinder block
- Engine overheating

12. Guidelines for Oil pressure problems (No reading)

Source or Cause possibly

- No oil in sump or reservoir
- Oil gauge not functioning properly
- Faulty oil pump
- Faulty valve or valve spring
- Loose connection or Faulty pressure gauge
- Leakage of oil

13. Guidelines for Oil pressure problems (low pressure reading)

Source or Cause possibly

- Less oil in sump or reservoir
- Oil Filter clogged
- Faulty or worn out oil pump
- Faulty or broken valve spring
- Faulty or slack main bearings
- Leakage of oil

Performance Analysis

14. Guidelines for Oil pressure problems (high pressure reading)

Source or Cause possibly

Oil lines clogged

Faulty or broken valve

Faulty or defective pressure gauge

High viscosity or improper grade oil

Fuel consumption checklist for a driver or owner (mileage and emission level influencer)

Date of response:

Time of response:

Do you idle your engine on a cold-start: Yes/No/Sometimes/Not applicable

Do you ensure your engine's idling speed is right or get this addressed whenever you can: Yes/No/Sometimes/Not applicable

Do you switch off your engine whenever not required or at halt times more than 1 minute: Yes/No/Sometimes/Not applicable

Do you address problems like engine overheating as soon as you can: Yes/No/Sometimes/Not applicable

Do you avoid changing gears often by speed control or by choosing right routes and lanes: Yes/No/Sometimes/Not applicable

Do you immediately address any problem with the flow of fuel or the functioning of the carburetor in your vehicle as soon as you can: Yes/No/Sometimes/Not applicable

Do you avoid using or switch off your vehicle's air-conditioner whenever you can: Yes/No/Sometimes/ Not applicable

Do you ask for recommendations from your service outlet for maintenance of good condition and mileage: Yes/No/Sometimes/Not applicable

Performance Analysis

Green your Trip planner (comfort levels influencer)

Date of response:

Time of response:

Do you use the best route option mostly: Yes/No/Sometimes/Not applicable

Do you use route forecasting options mostly: Yes/No/Sometimes/Not applicable

While planning a long-distance visit (within your city or town or region), do you plan according to weather forecasts, optimum distance, manageable stress levels, traffic volume levels and need for value-added services on-route: Yes/No/Sometimes/Not applicable

While planning a long-distance visit (outside your city, town or region), do you plan according to weather forecasts, best routes, comfort levels, minimal accidents or incidence trends, possible route diversions, availability of alternate transportation services, availability of emergency response services and need for other value-added services on-route: Yes/No/Sometimes/Not applicable

Would you like the search and navigate information services available today for commuting to be enhanced further, to interface with sentinel services at specific locations that can let you know beforehand occurrences or near probable occurrences of natural disasters, calamities, navigation problems, vital network and signal coverage failures, commuting hardships, and of any critical incidence management on-route: Yes/No/Sometimes/Not applicable

Would you like to know about any alpha assistance for impaired people in commuting: Yes/No/Not applicable

Performance Analysis

First-Aid services (health and safety influencer)

Date of response:

Time of response:

Does your vehicle have a first-aid kit compartment and are there provisions to maintain the same based on the medical history of your commuters or occupants: Yes/No/Sometimes/Not applicable

Does your vehicle have an air-bag to reduce impact to driver and co-passenger on collision: Yes/No/ Cannot comment/Not applicable

Is your vehicle fitted with a suitable fire extinguisher or alarm system that can warn occupants or commuters about the possibility of a fire or increasing smoke levels in the vehicle: Yes/No/ Cannot comment/Not applicable

Do you know whether your vehicle's windscreen, fenders, side-glasses, doors and chassis can sustain impact on collision at high-speed, and whether the manufacturer has issued warnings or recommendations to maintain speed control accordingly?

Do you know if the vehicle has been designed to facilitate safe exit for occupants: Yes/No/Cannot comment/Not applicable

Does your vehicle manufacturer proactively setup a service network that can provide emergency services or breakdown services within the shortest time durations: Yes/No/Cannot comment/Not applicable

Is your vehicle fitted with a suitable Global Positioning System (GPS) that can help such a service network track the location of vehicle and provide emergency or breakdown services within the shortest time durations: Yes/No/Cannot comment/Not applicable

Performance Analysis

Guidelines for safety, driving, and vehicle fitness testing

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

Performance Tuning List (ICE)

☐ **Engine sound and running check**

Condition; Ok/ Needs tuning/Needs maintenance/Needs repair/Needs replacement

☐ **Exhaust smoke check**

Condition; Ok/ Needs tuning/Needs maintenance/Needs repair/Needs replacement

☐ **Oil leak while idling or while running check**

Condition; Ok/ Needs tuning/Needs maintenance/Needs repair/Needs replacement

Performance Analysis

Performance Tuning List (ICE)

[] Noise conditions check (engine accessories, gears, bearings, suspension, drive line, tyres)

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Vibrations check (constant velocity joints, drive shafts, transmission mountings, suspension components, wheel bearings, brakes)

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] On-road check at normal driving speeds / high speeds (Acceleration or deceleration, lack of power output, excessive oil consumption, excessive fuel consumption, noise and vibration at turning, engine rpm thresholds)

Condition; Ok/Problematic but will function/Needs top-up or refilling/Needs replacement

Performance Analysis

Performance Tuning List (ICE)

- ☐ Test Drive **Safety check at normal driving speeds / high speeds (Acceleration or deceleration, lack of power output, excessive oil consumption, excessive fuel consumption, noise and vibration at turning, engine rpm thresholds)**

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

Specific to (Lack of power output)

- ☐ Low compression

Remedy: Overhaul engine/Replace parts as necessary

- ☐ Late ignition timing

Remedy: Adjust ignition timing and check engine running

- ☐ Improper functioning of carburetor and fuel pump

Remedy: Service carburetor or fuel pump properly and check engine running

Performance Analysis

Performance Tuning List (ICE) - Specific to (Lack of power output)

☐ Air cleaner clogged or blocked

Remedy: Clean or clear clogs/Replace if necessary

☐ Fuel lining clogged or blocked

Remedy: Clear clogged lines/Replace if necessary

☐ Engine temperature high

Remedy: Service cooling system/Replace as necessary

☐ Improper tappet clearance

Remedy: Adjust tappet clearance as in specification or as required/Replace parts as necessary

☐ Faulty valve timing or late valve timing

Remedy: Service valve/Adjust valve timing/Replace parts as necessary

Performance Analysis

Performance Tuning List (ICE)- Specific to (Lack of power output)

☐ Leaky gasket

Remedy: Replace gasket

☐ Muffler clogged or bent exhaust pipe

Remedy: Clean the muffler/straighten the exhaust pipe/Replace parts as necessary

Performance Analysis

Performance Tuning List (ICE) - Specific to (Excessive fuel consumption in ICE models)

[] Idling may be incorrect

Remedy: Adjust idling speed and check engine running

[] Air filter choked

Remedy: Clean properly/ Filament replacement

[] Clogged air bleeds and jets in carburettor

Remedy: Service carburettor properly/ Replace as necessary

[] Dysfunction of needle valve in carburettor

Remedy: Clean valve properly/ Replace as necessary

Performance Analysis

Performance Tuning List (ICE) - Specific to (Excessive fuel consumption in ICE models)

☐ Clutch lever linkage improperly adjusted

Remedy: Adjust properly

☐ Float punctured or damaged

Remedy: Replace float

☐ Float level improperly adjusted

Remedy: Adjust properly

☐ Fuel pump pressure too high

Remedy: Adjust properly by placing packing in seating

☐ Metering rod improper adjustment or worn out

Remedy: Adjust properly/ Replace as necessary

Performance Analysis

Performance Tuning List (ICE)- Specific to (Excessive oil consumption)

☐ Improper grade of oil used

Remedy: Use oil of standard quality and grade

☐ Leakage from oil sump/drain plug/crank case seating/joint packing/oil filter seating or packing

Remedy: Tighten properly/Needs repair/Needs replacement

☐ Leakage of oil from combustion chamber due to worn out piston rings or cylinder walls

Remedy: Overhauling/ Needs piston ring replacement

☐ Leakage from fuel pump seating, gear cover

Remedy: Tighten properly/ Replace packing

☐ Check holes of ring slots

Remedy: Remove pistons and piston rings & clean properly/ Replace as necessary

Maintenance, Repair and Tuning

Guidelines for whether the

[] vehicle needs to be pulled off the road

[] vehicle needs cost effective repairs to be on-road

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

Maintenance, Repair and Tuning List (ICE)

[] Abnormal noise check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

Maintenance, Repair and Tuning

Guidelines for whether the

[] vehicle needs to be pulled off the road

[] vehicle needs cost effective repairs to be on-road

Maintenance, Repair and Tuning List (ICE)

[] Air filter check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Battery electrolyte level check

Condition; Ok/Problematic but will function/Needs top-up or refilling/Needs replacement

[] Blinkers, bulbs and head lamps check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Bolts and Nuts tightening check (engine specific)

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

Maintenance, Repair and Tuning

Guidelines for whether the

[] vehicle needs to be pulled off the road

[] vehicle needs cost effective repairs to be on-road

Maintenance, Repair and Tuning List (ICE)

[] Bolts and Nuts tightening check (front and rear shock absorbers)

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Bolts and Nuts tightening check (front and rear tyres)

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Brake fluid level check

Condition; Ok/Problematic but will function/Needs top-up or refilling/Needs replacement

[] Brake disc condition check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Maintenance, Repair and Tuning List (ICE)

☐ Brake drum and lining check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Brake liners or pads check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Carburettor check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Maintenance, Repair and Tuning List (ICE)

☐ Chassis or body condition check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Clutch Pedal Play

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Coolant level check

Condition; Ok/Problematic but will function/Needs top-up or refilling/Needs replacement

☐ Differential oil check

Condition; Ok/Problematic but will function/Needs top-up or refilling/Needs replacement

Maintenance, Repair and Tuning

Guidelines for whether the

[] vehicle needs to be pulled off the road

[] vehicle needs cost effective repairs to be on-road

Maintenance, Repair and Tuning List (ICE)

[] Drive belts tension check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Drive shafts check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Engine oil level check

Condition; Ok/Problematic but will function/Needs top-up or refilling/Needs replacement

[] Entire electricity cables and connections check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Maintenance, Repair and Tuning List

☐ Exhaust system check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Fuel Lines Pipes Leakage check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Fuse box and fuses check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Gear Box oil check

Condition; Ok/Problematic but will function/Needs top-up or refilling/Needs replacement

Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Maintenance, Repair and Tuning List (ICE)

☐ Hoses, clamps and pipes check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Idling and proper acceleration check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Lubrication chart check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Power steering oil check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Maintenance, Repair and Tuning List (ICE)

☐ Seat and seat bolts check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Steering mechanism and play check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Suspension front and rear check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Tappet clearance check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Maintenance, Repair and Tuning List (ICE)

☐ Transmission oil check

Condition; Ok/Problematic but will function/Needs top-up or refilling/Needs replacement

☐ Trans-axle and axle check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Tyre condition check (rotate if necessary)

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Tyre pressure check

Condition; Ok/Problematic but will function/Needs refilling/Needs replacement

Maintenance, Repair and Tuning

Guidelines for whether the

[] vehicle needs to be pulled off the road

[] vehicle needs cost effective repairs to be on-road

Maintenance, Repair and Tuning List (ICE)

[] Cranking/engine sound check while being started (rotate if necessary)

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Universal joints and slip joints check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Vehicle pulling, Left wheel / Right wheel wobbling check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Wheel alignment and balancing check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (EV/Hybrid)

☐ Battery Check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Brakes / Regenerative Brakes Check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Electric Propulsion System Check / Motor Drives Check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Switched Reluctance Motor Drives/Induction Motor Drives/Gearing/ Differential Check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Power Flow Control / Vehicle Control Unit

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (EV/Hybrid)

☐ HEV Drive Trains

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ EV Chargers

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ EV Subsystems

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Accelerator Pedal Check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Steering Wheel Check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

Maintenance, Repair and Tuning

Guidelines for whether the

[] vehicle needs to be pulled off the road

[] vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (EV/Hybrid)

[] AC/ AC ECU Check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Cabin condition/ Blower Speed Control/ Ventilation System Check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] HVAC (Industry class) Check

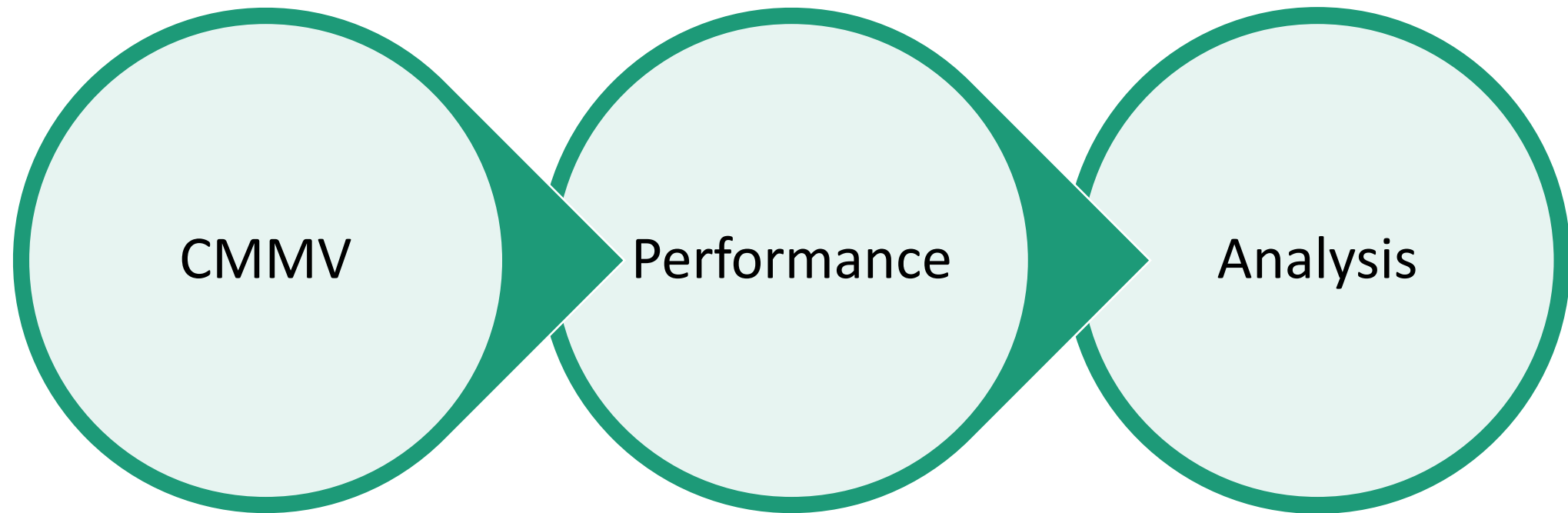
Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Accelerator Pedal Check/ Performance Check (in terms of responsiveness when the AC is on)

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

The responsiveness of the vehicle to acceleration “changes” when the AC is on due to AC compressor load, causing sudden decrease in power of the engine systems, or noticeable reduction in performance. Also important is that some vehicles have modern disengagement systems where pressing on the accelerator pedal more impactfully can disengage or turnoff the AC till regular acceleration

(Road Safety/Support Planner)



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 tankers, etc.

Passenger Commercial Vehicles:

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

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.

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 is used for transporting goods.
- **Wheel base, Number of wheels/tires (known to use radial or bias-ply construction)**
- **Ground clearance:** the 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

Top 10 accident categories or reasons

Driver fatigue	▼	Rear-end collisions	▼	Aggressive driving
Distracted driving	▼	Improperly loaded cargo	▼	Mechanical failures
Speeding	▼	Blind spots	▼	Underride
Weather	▼	Alcohol or drug impairment	▼	Cuts and lacerations
Fractures	▼	Rollover accidents	▼	T-bone accidents
Tire blowout	▼	Truck rollovers	▼	Dump truck accidents
Falling loads	▼	Inexperienced drivers	▼	Jackknife
Jackknife accidents	▼	Lack of training	▼	Traffic violations



Anti lock Braking System (ABS) - Performance, Information, Components and Systems

ABS Performance

Guidelines for safety, driving, and vehicle fitness testing

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

ABS Vehicle Experience

- ☐ **ABS helps safe and effective braking**
- ☐ **ABS improves control over steering during braking**
- ☐ **ABS improves control over vehicle during cornering**
- ☐ **ABS improves tyre life**
- ☐ **ABS reduces fuel consumption**

ABS Maintenance, Repair and Tuning

Guidelines for whether the

[] vehicle needs to be pulled off the road

[] vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

[] ABS Control Module / ABS Hydraulic Modulator

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] ABS Relay

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] ABS Hydraulic Actuator

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] ABS Warning Light

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

ABS Maintenance, Repair and Tuning

Guidelines for whether the

[] vehicle needs to be pulled off the road

[] vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

[] ABS Front Wheel (Right and Left Sensors)

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] ABS Rear Wheel Right and Left Sensors)

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] ABS Stop Light Switch

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] ABS self-test output

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement



Traction Control System (TCS) - Performance, Information, Components and Systems

TCS Performance

Guidelines for safety, driving, and vehicle fitness testing

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

TCS Vehicle Experience

☐ TCS helps improve contact between the road surface and tyres

☐ TCS helps control unwanted wheel spin

☐ TCS improves control over engine speed and torque

☐ TCS helps vehicle regain grip on skidding

TCS Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

☐ TCS Control Module / TCS Hydraulic Modulator

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ TCS Control Module

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ TCS Pump assembly

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ TCS Wheel Speed sensor

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

TCS Maintenance, Repair and Tuning

Guidelines for whether the

[] vehicle needs to be pulled off the road

[] vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

[] TCS Throttle Position Sensor

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] TCS Throttle Position module Buffer Box

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Throttle Cables

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Throttle Cable Relaxer Motor

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement



Electronic Stability Control (ESC) - Performance, Information, Components and Systems

ESC Performance

Guidelines for safety, driving, and vehicle fitness testing

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

ESC Vehicle Experience

☐ ESC helps improve stable driving in all directions

☐ ESC improves lateral movement when there can be a difference between the steering input and experienced vehicle movement / direction

☐ ESC improves intervention (in braking and/or in accelerating of driven wheels)

☐ ESC prevents skidding

☐ ESC helps in Hill Control

☐ ESC helps Hydraulic Brake Assist

☐ ESC helps Roll Over Mitigation

ESC Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

☐ ESC Control Module

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ TCS Control Module

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ ESC brake intervention actuator

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ ESC engine intervention actuator

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

ESC Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

☐ ESC Wheel Speed Sensor

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ ESC Steering Angle sensor

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ ESC Yaw-rate sensor

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ ESC lateral-acceleration sensor

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement



Hill Assistance System (HAS) - Performance, Information, Components and Systems

HAS Performance

Guidelines for safety, driving, and vehicle fitness testing

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

HAS Vehicle Experience

☐ HAS helps make hill or slope ascent stable

☐ HAS improves hill climbing movement when there can be a difference between the climbing input, or moving in front and experienced vehicle movement / direction

☐ HAS improves synchronism between the accelerator pedal and the brake pedal

☐ HAS helps in Hill Climbing and provides Assisted Control that resists uncontrolled downward movement

☐ HAS helps hold the vehicle in the same location without the use of the brake pedal

☐ HAS prevents skidding and uncontrolled sliding downwards

☐ HAS reduces vehicle accidents

HAS Maintenance, Repair and Tuning

Guidelines for whether the

[] vehicle needs to be pulled off the uphill road

[] vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

[] HAS ECU Control Module

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] HAS Accelerator Pedal Position Sensor

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] HAS & ESC brake intervention actuator

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] HAS gear position sensor

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

HAS Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the uphill road

☐ vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

☐ ABS Control Module

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Engine Torque detection sensor

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Disc Brakes

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ HAS & ESC descent / incline detection sensor

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

HAS Maintenance, Repair and Tuning

Guidelines for whether the

[] vehicle needs to be pulled off the uphill road

[] vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

[] HAS & ESC Wheel Speed Sensor

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] HAS & ESC Steering Angle sensor

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] HAS gyroscopic sensor

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement



Collision Avoidance Warning System (CAWS) - Performance, Information, Components and Systems

CAWS Performance

Guidelines for safety, driving, and vehicle fitness testing

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

Collision Avoidance Warning System in-Vehicle Experience

- [] The Radar calculates the distance between the vehicle and moving object
- [] The Visual warning system helps avoid potential collision with the moving object
- [] The Audio warning system helps avoid potential collision with the moving object
- [] The Timing circuit and pulse generator correctly generates pulses to detect collision possibility
- [] The Timing circuit and pulse generator correctly measures distance to the moving object
- [] The Timing circuit and pulse generator correctly measures the speed or velocity

CAWS Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

☐ Low power radar system

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Radar (transmitting and receiving) antenna mounted in the front of the vehicle

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Timing circuit and Pulse generator

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Microwave oscillator and modulator

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

CAWS Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

☐ Frequency Difference Amplifier

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Mixer that mixes antenna input with oscillator signal

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Pulse recovery system

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Signal Interference measurement system

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement



Autonomous Intelligence Cruise Control (AICC) - Performance, Information, Components and Systems

AICC Performance

Guidelines for safety, driving, and vehicle fitness testing

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

Autonomous Intelligence Cruise Control in-Vehicle Experience

- ☐ The AICC maintains speed set by the driver
- ☐ The AICC intelligently controls speed to maintain a safe distance from the object moving in front
- ☐ The AICC warning system helps avoid potential collision with the moving object
- ☐ The AICC correctly measures the distance / range of vehicle
- ☐ The AICC correctly measures the speed or velocity
- ☐ The AICC maintains speed in traffic
- ☐ The AICC maintains a safe following distance

AICC Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

☐ Vehicle Speed sensor

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Headway sensor (radar or lidar) mounted in the front of the vehicle

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Throttle position control sensor

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Steering angle sensor

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

AICC Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

☐ Brake Actuator

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ AICC related ECU

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Interference Filter module, Analog to Digital Converter, Fourier Transformation unit, Signal processing system

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Detector, (Visual and Audio) Warning systems

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement



Emergency Braking Assist –

Performance, Information,
Components and Systems for
NSSR-RS

EBA Performance

Guidelines for safety, driving, and vehicle fitness testing

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

EBA Vehicle Experience

- ☐ EBA improves safety and control in driving
- ☐ EBA assists braking on collision risk
- ☐ EBA improves safety in sudden and forceful braking
- ☐ EBA reduces stopping distance
- ☐ EBA works effectively in cross traffic situations
- ☐ EBA assists and improves pedestrian safety

EBA Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

☐ EBA RADARS

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ EBA Cameras

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Vehicle Speed Sensor

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Electronically enabled Braking system/ Emergency Brake Lever

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

EBA Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

☐ Visible/Audible/Haptic Warning Systems

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ EBA Handle-bar Vibration System

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Front and Rear Cross Traffic System / Pedestrian Collision system

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ ECU / ABS

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement



Tyre Pressure Monitoring Systems (TPMS) - Performance, Information, Components and Systems

TPMS Performance

Guidelines for safety, driving, and vehicle fitness testing

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

TPMS Vehicle Experience

- ☐ TPMS improves handling and stability in driving
- ☐ TPMS alerts when tyre pressure is low or if there is rapid pressure loss
- ☐ TPMS improves safety by reducing the wear of tyre or incidences of a blow-out / punctured tyre
- ☐ TPMS improves fuel efficiency
- ☐ TPMS reduces hydroplaning when an under-inflated tyre loses contact with the road surface in wet conditions
- ☐ TPMS ensures proper stopping distance

TPMS Maintenance, Repair and Tuning

Guidelines for whether the

[] vehicle needs to be pulled off the road

[] vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

[] TPMS Tyre Pressure Sensors

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] TPMS Warning System/Lamp

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] TPMS Transmission Link

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] TPMS Signal Processor

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

TPMS Maintenance, Repair and Tuning

Guidelines for whether the

[] vehicle needs to be pulled off the road

[] vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (Electronic Vehicle Safety Systems)

[] TPMS Instrument Panel

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] TPMS Ignition on status

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] TPMS Signal Transmitter / Receiver

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] TPMS Driver Reset

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement



Performance Analysis, Information, Components and Systems for NSSR-RS

(Revisited section as it is important for road safety)

Performance Analysis

Guidelines for safety, driving, and vehicle fitness testing

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

Road Safety Checklist

[] Protection in normal driving or in an accident (Vehicle ability to withstand Higher shock loads?)

Condition: Ok/ Needs crash safety planning/Needs maintenance/Needs repair/Needs replacement

[] Protection in normal driving or in an accident (Visibility related to the – Eye position of driver, angle of visibility, spacing for seating, need for rearward visibility?)

Condition: Ok/ Needs crash safety planning/Needs maintenance/Needs repair/Needs replacement

[] Protection in an accident (Effect of Collision on the – Front, Rear, sides, sudden tilt, impacted roll over)

Condition: Ok/ Needs crash safety planning/Needs maintenance/Needs repair/Needs replacement

Performance Analysis

Guidelines for safety, driving, and vehicle fitness testing

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

Road Safety Checklist

☐ **Protection in driving or collision (There should be no items coming loose)**

Condition: Ok/ Needs crash safety planning/Needs maintenance/Needs repair/Needs replacement

☐ **Protection in accident (Hertomatic Flashers and beepers – ignition automatically turning off)**

Condition: Ok/ Needs crash safety planning/Needs maintenance/Needs repair/Needs replacement

☐ **Whether relevant Fire wall separating engine compartment and driver compartment has been incorporated?**

Condition: Ok/ Needs crash safety planning/Needs maintenance/Needs repair/Needs replacement

Performance Analysis

Guidelines for safety, driving, and vehicle fitness testing

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

Road Safety / Fitness Checklist

[] Whether braking system works effectively (for limit of road grip, manoeuvrability, vehicle speed for type of track surface, produces brake pedal pulsations in difficult track conditions)?

Condition: Ok/ Needs crash safety planning/Needs maintenance/Needs repair/Needs replacement

[] Guidelines for possible Engine noises

Condition: Known/ Needs review/Needs maintenance/Needs repair/Needs replacement

[] Guidelines for possible Crank noises

Condition: Known/ Needs review/Needs maintenance/Needs repair/Needs replacement

Performance Analysis

Guidelines for safety, driving, and vehicle fitness testing

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

Road Safety / Fitness Checklist

[] Guidelines for possible **Piston noises**

Condition: Known/ Needs review/Needs maintenance/Needs repair/Needs replacement

[] Guidelines for possible **Valve Train noises**

Condition: Known/ Needs review/Needs maintenance/Needs repair/Needs replacement

[] Guidelines for possible **pre-ignition problems**

Condition: Known/ Needs review/Needs maintenance/Needs repair/Needs replacement

[] Guidelines and **Causes for the Engine to not crank or fully start**

Condition: Known/ Needs review/Needs maintenance/Needs repair/Needs replacement

Performance Analysis

Guidelines for safety, driving, and vehicle fitness testing

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

Road Safety / Fitness Checklist

[] Guidelines for the Engine to crank slowly but does not start

Condition: Known/ Needs review/Needs maintenance/Needs repair/Needs replacement

[] Guidelines for what can cause Excessive smoke (Black)

Condition: Known/ Needs review/Needs maintenance/Needs repair/Needs replacement

[] Guidelines for what can cause Excessive smoke (Blue)

Condition: Known/ Needs review/Needs maintenance/Needs repair/Needs replacement

[] Guidelines for what can cause Excessive smoke (White)

Condition: Known/ Needs review/Needs maintenance/Needs repair/Needs replacement

Performance Analysis

Guidelines for safety, driving, and vehicle fitness testing

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

Road Safety / Fitness Checklist

[] Guidelines for what causes the Loss of coolant

Condition: Known/ Needs review/Needs maintenance/Needs repair/Needs replacement

[] Guidelines for Oil pressure problems (No reading)

Condition: Known/ Needs review/Needs maintenance/Needs repair/Needs replacement

[] Guidelines for Oil pressure problems (low pressure reading)

Condition: Known/ Needs review/Needs maintenance/Needs repair/Needs replacement

[] Guidelines for Oil pressure problems (high pressure reading)

Condition: Known/ Needs review/Needs maintenance/Needs repair/Needs replacement

Performance Analysis

1. Guidelines for possible Engine noises

Tap sound

Rattle sound

Light knocking

Deep knocking

Irregular heavy knocking

Rumble noise

Slapping noise

Vibrating sounds

Clatter noise

Hiss sound

Roar sound

Clunking sound

Whining sound

Shrieking sound

Squealing

Snapping sound on engine overhauling

Starved sound with high speed acceleration noise on starting - Timing belt problems

Source or Cause possibly

Improper adjustment of Valve clearance

Loose or broken components like piston rings

Small end bearings worn out

Big end bearings worn out

Loose fly wheel

Main bearings worn out

Worn out piston or bores

Loose fittings of components

Broken rocker shaft or broken piston rings

Leak from inlet or exhaust manifolds or connections

Air filter malfunctioning noise, Air filter failure

Loose fly wheel, worn out thrust bearing, loose damper pulley

Malfunction in power steering or alternate bearings

Dry bearings in ancillary components

Slipping drive belt

Tight fitting of piston rings

Timing belt problems

2. Guidelines for possible Crank noises

Source or Cause possibly

Excessive clearance in main bearings

Main journals out of alignment

Excessive axial play in crank shaft

Low oil pressure

Unbalanced crank shaft

Loose fly wheel

Loose fitting of main journals and main bearing caps

Improper seating of thrust bearings

Loose damper pulley

Excessive play in main journal bearings

Timing belt problems

3. Guidelines for possible Piston noises (sharp noises while at idling speed)

Source or Cause possibly

Excessive side clearance

Loose fitting in small end bearing

Bent connecting rod

More clearance between piston pin and boss

Performance Analysis

4. Guidelines for possible Valve Train Noise

Source or Cause possibly

- Improper adjustment of valve clearance
- Bent push rod
- Worn out rocker arm and valve tip
- Warped valve
- Carbonized or scored valve stems
- Excessive clearance between valve stem and valve guide
- Worn out or broken valve spring
- Improper valve timing
- Worn out cam lobes
- Broken or damaged valve lifter
- Loose fitting of adjustment screw and nut for valve tappet clearance

5. Guidelines for Pre-ignition problems (deposits in combustion chambers and/or on spark plugs)

Experience - poor acceleration, engine roughness and reduced top speed Source or Cause possibly

- Clogging of carburettor jets
- Improper idling
- Loose fitting of spark plugs
- Improved driving / Maintaining constant speed when possible

6. Guidelines for Causes for the Engine to not crank or fully start

Source or Cause possibly

- Defective starting motor
- Defective battery
- Loose connection of battery wire and starting motor wire
- Fly wheel problem needing servicing
- Worn out teeth of fly wheel
- Slow running of armature shaft
- Timing belt problems

7. Guidelines for the Causes for the Engine to crank slowly but does not start

Source or Cause possibly

- Defective fuel pump
- Fuel line blocked
- Fuel filter blocked
- Defective Fuel pump
- Air lock or air may be present in fuel line
- Less Fuel in tank
- Air cleaner blocked
- Defective fuel injector
- Worn out valves and springs in pump
- What can cause Over heating of engine Source or Cause possibly
- Loose fan belt
- Radiator blocked or surface area reduction
- Radiator tubes blocked
- Improper opening of thermostat valve
- Hose pipes blocked
- Coolant pump malfunctioning
- Coolant jackets and hoses may be clogged
- Head gasket seating improper
- Coolant level low
- Leakage of coolant from radiator
- Early or late ignition problem
- Clutch slipping
- Brake jamming or drag
- Tight wheel bearings

Performance Analysis

8. Guidelines for what can cause Excessive smoke (Black)

Source or Cause possibly

- Choked Air filter
- Fuel injection pump not properly calibrated
- Defective injector
- Defective governor diaphragm
- Incorrect valve clearance
- Poor compression

9. Guidelines for what can cause Excessive smoke (Blue)

Source or Cause possibly

- Sticky or broken piston rings
- Worn out cylinder bores
- Weak compression
- Oil level in oil sump not proper
- Mixing of lubricating oil with fuel
- Improper grade engine oil
- Improper grade lubricating oil

10. Guidelines for what can cause Excessive smoke (White)

Source or Cause possibly

- Defective valve seating
- Fuel injection pump not properly calibrated
- Delay between injection and combustion of fuel
- More unburnt fuel
- Low operating temperature

11. Guidelines for what causes the Loss of coolant

Source or Cause possibly

- Radiator leakage
- Hose pipe leakage
- Loose drain plug or drain plug leakage
- Oil seal damaged for pump
- Leaky or faulty head gasket
- Damaged or cracked pump casing
- Improper or Loose or damaged thermostat or valve packing
- Faulty or missing radiator cap
- Crack in cylinder block
- Engine overheating

12. Guidelines for Oil pressure problems (No reading)

Source or Cause possibly

- No oil in sump or reservoir
- Oil gauge not functioning properly
- Faulty oil pump
- Faulty valve or valve spring
- Loose connection or Faulty pressure gauge
- Leakage of oil

13. Guidelines for Oil pressure problems (low pressure reading)

Source or Cause possibly

- Less oil in sump or reservoir
- Oil Filter clogged
- Faulty or worn out oil pump
- Faulty or broken valve spring
- Faulty or slack main bearings
- Leakage of oil

Performance Analysis

14. Guidelines for Oil pressure problems (high pressure reading)

Source or Cause possibly

Oil lines clogged

Faulty or broken valve

Faulty or defective pressure gauge

High viscosity or improper grade oil

Fuel consumption checklist for a driver or owner (mileage and emission level influencer)

Date of response:

Time of response:

Do you idle your engine on a cold-start: Yes/No/Sometimes/Not applicable

Do you ensure your engine's idling speed is right or get this addressed whenever you can: Yes/No/Sometimes/Not applicable

Do you switch off your engine whenever not required or at halt times more than 1 minute: Yes/No/Sometimes/Not applicable

Do you address problems like engine overheating as soon as you can: Yes/No/Sometimes/Not applicable

Do you avoid changing gears often by speed control or by choosing right routes and lanes: Yes/No/Sometimes/Not applicable

Do you immediately address any problem with the flow of fuel or the functioning of the carburetor in your vehicle as soon as you can: Yes/No/Sometimes/Not applicable

Do you avoid using or switch off your vehicle's air-conditioner whenever you can: Yes/No/Sometimes/ Not applicable

Do you ask for recommendations from your service outlet for maintenance of good condition and mileage: Yes/No/Sometimes/Not applicable

Performance Analysis

Green your Trip planner (comfort levels influencer)

Date of response:

Time of response:

Do you use the best route option mostly: Yes/No/Sometimes/Not applicable

Do you use route forecasting options mostly: Yes/No/Sometimes/Not applicable

While planning a long-distance visit (within your city or town or region), do you plan according to weather forecasts, optimum distance, manageable stress levels, traffic volume levels and need for value-added services on-route: Yes/No/Sometimes/Not applicable

While planning a long-distance visit (outside your city, town or region), do you plan according to weather forecasts, best routes, comfort levels, minimal accidents or incidence trends, possible route diversions, availability of alternate transportation services, availability of emergency response services and need for other value-added services on-route: Yes/No/Sometimes/Not applicable

Would you like the search and navigate information services available today for commuting to be enhanced further, to interface with sentinel services at specific locations that can let you know beforehand occurrences or near probable occurrences of natural disasters, calamities, navigation problems, vital network and signal coverage failures, commuting hardships, and of any critical incidence management on-route: Yes/No/Sometimes/Not applicable

Would you like to know about any alpha assistance for impaired people in commuting: Yes/No/Not applicable

Performance Analysis

First-Aid services (health and safety influencer)

Date of response:

Time of response:

Does your vehicle have a first-aid kit compartment and are there provisions to maintain the same based on the medical history of your commuters or occupants: Yes/No/Sometimes/Not applicable

Does your vehicle have an air-bag to reduce impact to driver and co-passenger on collision: Yes/No/ Cannot comment/Not applicable

Is your vehicle fitted with a suitable fire extinguisher or alarm system that can warn occupants or commuters about the possibility of a fire or increasing smoke levels in the vehicle: Yes/No/ Cannot comment/Not applicable

Do you know whether your vehicle's windscreen, fenders, side-glasses, doors and chassis can sustain impact on collision at high-speed, and whether the manufacturer has issued warnings or recommendations to maintain speed control accordingly?

Do you know if the vehicle has been designed to facilitate safe exit for occupants: Yes/No/Cannot comment/Not applicable

Does your vehicle manufacturer proactively setup a service network that can provide emergency services or breakdown services within the shortest time durations: Yes/No/Cannot comment/Not applicable

Is your vehicle fitted with a suitable Global Positioning System (GPS) that can help such a service network track the location of vehicle and provide emergency or breakdown services within the shortest time durations: Yes/No/Cannot comment/Not applicable

Performance Analysis

Guidelines for safety, driving, and vehicle fitness testing

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

Performance Tuning List (ICE)

☐ **Engine sound and running check**

Condition; Ok/ Needs tuning/Needs maintenance/Needs repair/Needs replacement

☐ **Exhaust smoke check**

Condition; Ok/ Needs tuning/Needs maintenance/Needs repair/Needs replacement

☐ **Oil leak while idling or while running check**

Condition; Ok/ Needs tuning/Needs maintenance/Needs repair/Needs replacement

Performance Analysis

Performance Tuning List (ICE)

[] Noise conditions check (engine accessories, gears, bearings, suspension, drive line, tyres)

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Vibrations check (constant velocity joints, drive shafts, transmission mountings, suspension components, wheel bearings, brakes)

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] On-road check at normal driving speeds / high speeds (Acceleration or deceleration, lack of power output, excessive oil consumption, excessive fuel consumption, noise and vibration at turning, engine rpm thresholds)

Condition; Ok/Problematic but will function/Needs top-up or refilling/Needs replacement

Performance Analysis

Performance Tuning List (ICE)

- ☐ Test Drive **Safety check at normal driving speeds / high speeds (Acceleration or deceleration, lack of power output, excessive oil consumption, excessive fuel consumption, noise and vibration at turning, engine rpm thresholds)**

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

Specific to (Lack of power output)

- ☐ Low compression

Remedy: Overhaul engine/Replace parts as necessary

- ☐ Late ignition timing

Remedy: Adjust ignition timing and check engine running

- ☐ Improper functioning of carburetor and fuel pump

Remedy: Service carburetor or fuel pump properly and check engine running

Performance Analysis

Performance Tuning List (ICE) - Specific to (Lack of power output)

☐ Air cleaner clogged or blocked

Remedy: Clean or clear clogs/Replace if necessary

☐ Fuel lining clogged or blocked

Remedy: Clear clogged lines/Replace if necessary

☐ Engine temperature high

Remedy: Service cooling system/Replace as necessary

☐ Improper tappet clearance

Remedy: Adjust tappet clearance as in specification or as required/Replace parts as necessary

☐ Faulty valve timing or late valve timing

Remedy: Service valve/Adjust valve timing/Replace parts as necessary

Performance Analysis

Performance Tuning List (ICE)- Specific to (Lack of power output)

☐ Leaky gasket

Remedy: Replace gasket

☐ Muffler clogged or bent exhaust pipe

Remedy: Clean the muffler/straighten the exhaust pipe/Replace parts as necessary

Performance Analysis

Performance Tuning List (ICE) - Specific to (Excessive fuel consumption in ICE models)

[] Idling may be incorrect

Remedy: Adjust idling speed and check engine running

[] Air filter choked

Remedy: Clean properly/ Filament replacement

[] Clogged air bleeds and jets in carburettor

Remedy: Service carburettor properly/ Replace as necessary

[] Dysfunction of needle valve in carburettor

Remedy: Clean valve properly/ Replace as necessary

Performance Analysis

Performance Tuning List (ICE) - Specific to (Excessive fuel consumption in ICE models)

☐ Clutch lever linkage improperly adjusted

Remedy: Adjust properly

☐ Float punctured or damaged

Remedy: Replace float

☐ Float level improperly adjusted

Remedy: Adjust properly

☐ Fuel pump pressure too high

Remedy: Adjust properly by placing packing in seating

☐ Metering rod improper adjustment or worn out

Remedy: Adjust properly/ Replace as necessary

Performance Analysis

Performance Tuning List (ICE)- Specific to (Excessive oil consumption)

☐ Improper grade of oil used

Remedy: Use oil of standard quality and grade

☐ Leakage from oil sump/drain plug/crank case seating/joint packing/oil filter seating or packing

Remedy: Tighten properly/Needs repair/Needs replacement

☐ Leakage of oil from combustion chamber due to worn out piston rings or cylinder walls

Remedy: Overhauling/ Needs piston ring replacement

☐ Leakage from fuel pump seating, gear cover

Remedy: Tighten properly/ Replace packing

☐ Check holes of ring slots

Remedy: Remove pistons and piston rings & clean properly/ Replace as necessary

Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Vehicle Reg No (as applicable):

Manufacturer:

Model:

Variant:

Maintenance, Repair and Tuning List (ICE)

☐ Abnormal noise check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

Maintenance, Repair and Tuning

Guidelines for whether the

[] vehicle needs to be pulled off the road

[] vehicle needs cost effective repairs to be on-road

Maintenance, Repair and Tuning List (ICE)

[] Air filter check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Battery electrolyte level check

Condition; Ok/Problematic but will function/Needs top-up or refilling/Needs replacement

[] Blinkers, bulbs and head lamps check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Bolts and Nuts tightening check (engine specific)

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

Maintenance, Repair and Tuning

Guidelines for whether the

[] vehicle needs to be pulled off the road

[] vehicle needs cost effective repairs to be on-road

Maintenance, Repair and Tuning List (ICE)

[] Bolts and Nuts tightening check (front and rear shock absorbers)

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Bolts and Nuts tightening check (front and rear tyres)

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Brake fluid level check

Condition; Ok/Problematic but will function/Needs top-up or refilling/Needs replacement

[] Brake disc condition check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Maintenance, Repair and Tuning List (ICE)

☐ Brake drum and lining check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Brake liners or pads check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Carburettor check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Maintenance, Repair and Tuning List (ICE)

☐ Chassis or body condition check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Clutch Pedal Play

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Coolant level check

Condition; Ok/Problematic but will function/Needs top-up or refilling/Needs replacement

☐ Differential oil check

Condition; Ok/Problematic but will function/Needs top-up or refilling/Needs replacement

Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Maintenance, Repair and Tuning List (ICE)

☐ Drive belts tension check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Drive shafts check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Engine oil level check

Condition; Ok/Problematic but will function/Needs top-up or refilling/Needs replacement

☐ Entire electricity cables and connections check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Maintenance, Repair and Tuning List

☐ Exhaust system check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Fuel Lines Pipes Leakage check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Fuse box and fuses check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Gear Box oil check

Condition; Ok/Problematic but will function/Needs top-up or refilling/Needs replacement

Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Maintenance, Repair and Tuning List (ICE)

☐ Hoses, clamps and pipes check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Idling and proper acceleration check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Lubrication chart check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Power steering oil check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Maintenance, Repair and Tuning List (ICE)

☐ Seat and seat bolts check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Steering mechanism and play check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Suspension front and rear check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Tappet clearance check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

Maintenance, Repair and Tuning

Guidelines for whether the

[] vehicle needs to be pulled off the road

[] vehicle needs cost effective repairs to be on-road

Maintenance, Repair and Tuning List (ICE)

[] Transmission oil check

Condition; Ok/Problematic but will function/Needs top-up or refilling/Needs replacement

[] Trans-axle and axle check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Tyre condition check (rotate if necessary)

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Tyre pressure check

Condition; Ok/Problematic but will function/Needs refilling/Needs replacement

Maintenance, Repair and Tuning

Guidelines for whether the

[] vehicle needs to be pulled off the road

[] vehicle needs cost effective repairs to be on-road

Maintenance, Repair and Tuning List (ICE)

[] Cranking/engine sound check while being started (rotate if necessary)

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Universal joints and slip joints check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Vehicle pulling, Left wheel / Right wheel wobbling check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Wheel alignment and balancing check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (EV/Hybrid)

☐ Battery Check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Brakes / Regenerative Brakes Check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Electric Propulsion System Check / Motor Drives Check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Switched Reluctance Motor Drives/Induction Motor Drives/Gearing/ Differential Check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Power Flow Control / Vehicle Control Unit

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

Maintenance, Repair and Tuning

Guidelines for whether the

☐ vehicle needs to be pulled off the road

☐ vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (EV/Hybrid)

☐ HEV Drive Trains

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ EV Chargers

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ EV Subsystems

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Accelerator Pedal Check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

☐ Steering Wheel Check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

Maintenance, Repair and Tuning

Guidelines for whether the

[] vehicle needs to be pulled off the road

[] vehicle needs cost effective repairs to be on-road

Maintenance, Repair, and Tuning List (EV/Hybrid)

[] AC/ AC ECU Check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Cabin condition/ Blower Speed Control/ Ventilation System Check

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] HVAC (Industry class) Check

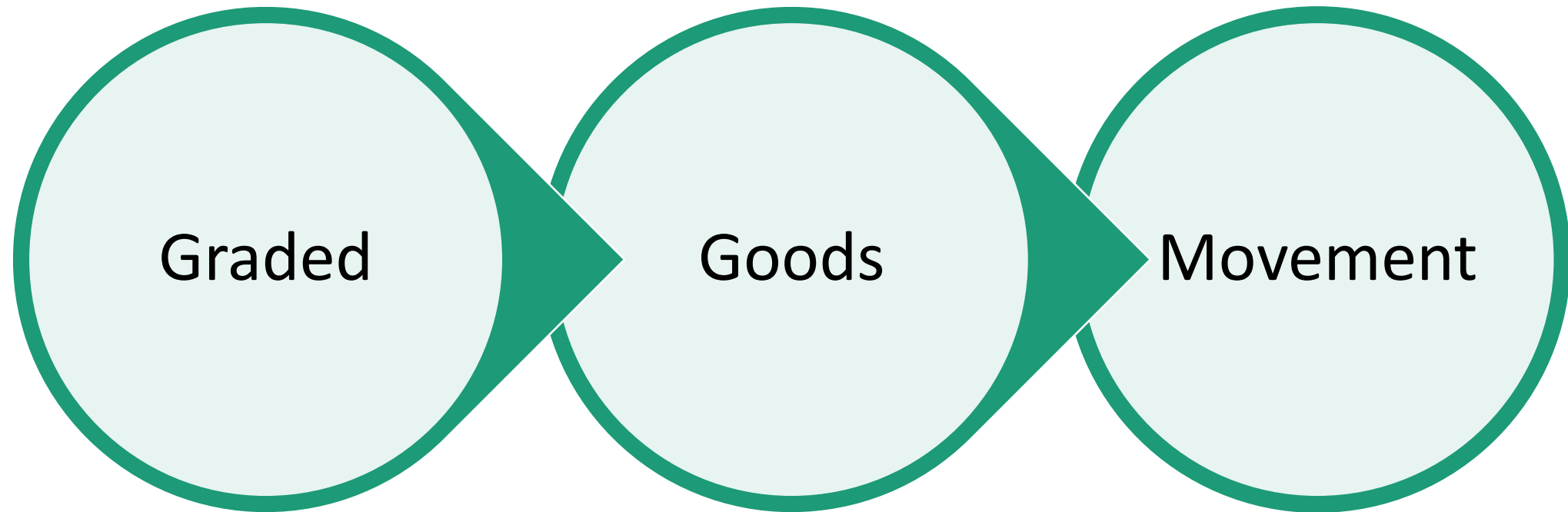
Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

[] Accelerator Pedal Check/ Performance Check (in terms of responsiveness when the AC is on)

Condition; Ok/Problematic but will function/Needs maintenance/Needs repair/Needs replacement

The responsiveness of the vehicle to acceleration “changes” when the AC is on due to AC compressor load, causing sudden decrease in power of the engine systems, or noticeable reduction in performance. Also important is that some vehicles have modern disengagement systems where pressing on the accelerator pedal more impactfully can disengage or turnoff the AC till regular acceleration

(Road Safety/Support Planner)





A Graded choice of commercial vehicles must be based on the brand/model/variant being

1. Responsive Quality for long journeys
2. Connecting need with suitability
3. Understanding the customer's open-ended concerns about a need for safe and sustainable transportation of goods with AI inferencing getting incorporated via case studies and dashboarding

Pyramidal framework for sustainable emergence

Emergence by understanding Problem susceptibility and course of action



Systemic Earth Quotient (SEQ) Endeavour	Applicable Focal Point for sustainable emergence	
Commercial vehicle models and variants for	Global Need	[Y]
	Regional Value	[Y]
	State Value	[Y]
AI inferencing for ease of ownership (EZEE) grades	SEQ Network Ripple Factor	[Y]
	SEQ Product Ripple Factor	[Y]
Key Opinion Leadership & Action Centre based Communications	Yes to EZEE practices [Y]	
Distribution/Supply/Warehousing	Yes to EZEE practices [Y]	
Sale/Resale/Redressal/Resupply	Yes to EZEE practices [Y]	
Proven (Mission specific) Value	Yes to EZEE practices [Y]	
Continual focus and FAST Tracking	Yes to EZEE practices [Y]	
End of life and Next steps	Yes to EZEE practices [Y]	



Associating a Consumer Behavior Model (Nicosia model)

Associating the Nicosia model

- 1.Can the organization associate a customer behavior model with the customers/ goods transportation providers/ goods suppliers that have availed of its vehicles and services? Can this besed to reach more of such customers and increase market share? Yes/No/Partially
- 2.To assess a customer/goods transportation provider/goods supplier according to the Nicosia model, the organization must assess the following aspects of purchase?
 - a. The customer/good transportation provider/goods supplier got to know about the organization or the vehicles from an advertisement? Yes/No
 - b. The customer/goods transportation provider/goods supplier heard about the organization or the vehicles from another goods supplier/goods transportation innovator or solutions provider? Yes/No
 - c. The customer/goods transportation provider/goods supplier heard about the organization or the vehicles from a partner or supply chain associate or top of line referral like an employer or more simply a co-worker or direct customer (like a relative/friend)? Yes/No
 - d. The customer/goods transportation provider/goods supplier simply purchased the vehicle/vehicles? Yes/No

Associating the Nicosia model

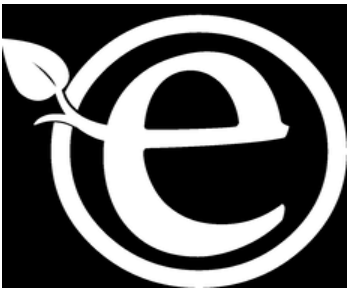
- The answers to the first field of questions can be processed for better advertising strategy formulation, to form an input to the second field of questions that follow:
- a. The customer/goods transportation provider/goods supplier made a choice without considering any alternatives? Yes/No
- b. The customer/ goods transportation provider/goods supplier made a choice due to a policy for an expected ride experience"? Yes/No
- c. The customer/ / goods transportation provider/goods supplier made a choice after weighing different factors like the organization's or vehicle's credibility, solution appropriateness, safety features, appropriateness, location & convenience of point-of-sale services, or service workshops, customer relationship, pricing? Yes/No
- d. The customer/ goods transportation provider/goods supplier made a choice due to specialty of the organization or vehicle? Yes/No
- The answers to the second field of questions can be processed for better search and evaluation promotional strategy formulations, to form an input for the third field of questions that follow:

Associating the Nicosia model

- a. Did the customer/ goods transportation provider/goods supplier choose the organization or its vehicles out of influences like distinctiveness, environment friendly nature and/or safety features, credibility, specialty etc (known as positive motivation)? Yes/No
- b. Did the customer/ goods transportation provider/goods supplier choose the organization or vehicle as immediate attention could be sought, or point of contact services where simply available, or as the cost for purchase, utilization and maintenance was cheaper in comparison to other alternatives, etc (known as negative motivation)? Yes/No
- c. Did the customer/ goods transportation provider/goods supplier choose the organization or vehicle after seeking some incidences specific findings or negative feedback clarifications? Yes/No
- The answers to the third field of questions can be processed for better organizational image or service deservedness strategy formulations, to form an input for the fourth field of questions that follow.

Associating the Nicosia model

- a. Did the customer/ goods transportation provider/goods supplier provide any positive feedback about the vehicle & services availed or point of sales consulted (known as positive performance)? Yes/No
- b. Did the customer/ goods transportation provider/goods supplier provide any negative feedback about the vehicle & services availed or point of sales consulted (known as negative performance)? Yes/No
- c. Did the customer/ goods transportation provider/goods supplier discontinue purchase, utilization, or continual utilization & maintenance (known as aborted/ degenerative performance)? Yes/No
- d. Did the customer/ goods transportation provider/goods supplier record any complaints about the vehicle & services availed (known as vital input for better performance)? Yes/No
- The answers to the fourth field of questions can be processed for better performance and continual excellence strategy formulations.



Associating a Consumer Behavior Model (Howard Sheth model)

Associating the Howard Sheth model

- 1.The Howard Sheth model is more comprehensive than the Nicosia model for understanding consumer behavior. This model helps you classify your customers/ goods transportation providers/goods suppliers on the basis of specific stimulus, expectations or motives.
- 2.To assess a customer/ goods transportation provider/goods supplier according to the Howard Sheth model
- **Influencer A:** The customer/ goods transportation provider/goods supplier got to know about the organization or vehicle due to certain stimulus such as

• Distinctiveness? Yes/No	Reflection of performance expectations? Yes/No
• Quality? Yes/No	Environmental nature and/or safety features? Yes/No
• Specialty in nature of solution? Yes/No	Specialty in services offered? Yes/No
• Pricing? Yes/No	Nature of service policy? Yes/No
- Availability of the organization or vehicle? Yes/No

Associating the Howard Sheth model

- **Influencer B:**The customer/ goods transportation provider/goods supplier selected the organization or vehicle on the basis of certain internal viewpoints like
 - Past experience? Yes/No
 - Perception about organizational image? Yes/No
 - Perception about the vehicle quality and cost effectiveness? Yes/No
 - Word of mouth influence? Yes/No
 - Personal analysis or needs based motive? Yes/No
 - Mindset to invest in niche, path breaking solutions or innovations? Yes/No
 - Attitude? Yes/No

Associating the Howard Sheth model

- **Influencer C:** The customer/ goods transportation provider/goods supplier selected the organization or vehicle on the basis of certain industry focus, market interests, social factors or exogenous factors like:
- Key contributor or role for sustainable transportation? Yes/No
- Top 10 or must have vehicles or transportation solutions focus? Yes/No
- Transportation segment preferences? Yes/No Consumer segment preferences? Yes/No
- Requirements due to background (like being from a country, state, city, location, or segment of industry)? Yes/No
- Financial status? Yes/No
- Ease of ownership for Social class? Yes/No Preferences or better performance? Yes/No
- Recommendation of reference groups? Yes/No
- Time availability? Yes/No

Associating the Howard Sheth model

- The answers to each of the influencers determine whether the customer/ goods transportation provider/goods supplier made a choice in selecting an organization or vehicle by considering factors that can be processed for better vision for the domain, operations and continual excellence strategy formulations.
- **Focus areas for the different influencers**
 - 1. Choices made out by considering factors in **Influencer A**: Organizational image, visibility of the organization or vehicle, safety features, reflection of expectations for performance, competitive differentiation
 - 2. Choices made out by considering factors in **Influencer B**: Organizational image, promotions for capturing market share, credible nature of vehicle/services or exclusiveness in nature of vehicle/services, willingness of organization to address gaps in availability of a particular kind of transportation solution to businesses or consumers of this segment of the industry, understanding of attitude of goods suppliers/ goods transportation providers/innovators/matter of fact decision-makers or product innovation interested younger generations etc

Associating the Howard Sheth model

- 3. Choices made out by considering factors in **Influencer C**:
- Differential pricing, suitability for any or specific business/consumer segment or social class, influences on decision mediators, instrumental investors or businesses causing preferences in the industry, supply chain, dependent families, business communities and reference groups
- The choices made by customers/ goods transportation providers/goods suppliers under the 3 influencers lead to vital **response outcome** variables for marketing, where the mentioned focus areas can thereon help the organization establish or improve its market presence, vehicle or solution visibility and deservedness.



Associating a Consumer Behavior Model (Multi-mediation model)

Associating the Multi-mediation model

- 1.The Engel, Blackwell and Kollat's Multi-mediation model is even more comprehensive than the Howard Sheth model for understanding consumer behavior.
- This model takes into account different environmental influences along with the basis of specific stimulus, expectations or motives of customers/ goods transportation providers/goods suppliers.
- 2.To assess a customer/ goods transportation provider/goods supplier according to the Multi-mediation model
- a. **Information processing:** Getting to know more about the customer/ goods transportation provider/goods supplier in terms of certain general stimulus such as
 - Specialty vehicle and services offered? Yes/No
 - Green vehicle or solution or Sustainable vehicle or solution? Yes/No
 - Distinctiveness? Yes/No Reflection of performance expectations? Yes/No
 - Quality? Yes/No Environmentally friendly nature and/or safety features? Yes/No
 - Pricing? Yes/No Nature of service policy? Yes/No

Associating the Multi-mediation model

- Right availability of the organization or vehicle? Yes/No
- Customer's exposure to availing of exclusive transportation vehicles and services? Yes/No
- Customer's exposure to availing of similar transportation vehicles and services? Yes/No
- Individual Business Preferences? Yes/No
- **Central control areas:** Getting to know more about the customer/ goods transportation provider/goods supplier in terms of certain psychological stimulus such as
 - Past experience? Yes/No
 - Perception about needs? Yes/No
 - Attitude towards need or problem resolution? Yes/No
 - Whether easily influenced? Yes/No

Associating the Multi-mediation model

- Takes decisions after weighing pros and cons? Yes/No
- Checks details like success rate, past performance? Yes/No
- c. **Decision process:** Getting to know more about the decision process of the customer/ goods transportation provider/goods supplier in terms of aspects such as
 - Shows need/problem recognition? Yes/No
 - Relies on awareness, internal search, reflection and evaluation? Yes/No
 - Relies on industry influencers, social contact, external search, and evaluation? Yes/No
 - Has preferences about purchase processes that ensure right choice? Yes/No
 - Shows keenness about post-purchase processes like customer satisfaction, issue resolution or replacement policy, complaint redressal? Yes/No

Associating the Multi-mediation model

- Shows active interest in tangible evidence like dealer network infrastructure, facilities, interiors of service centres/workshops/customer care delivery departments, interiors of point of sale showrooms, booking of vehicle to delivery lifecycle related systems & point of contact related systems, records, product and service packaging, owner's guidance to vehicle parts/components & useful life information, quality information, vehicle & services related communications, statistics, manuals, stationery? Yes/No
- **Key aspects of the Multi-mediation model**
- The important aspect is that this model considers that the stimulus behind a customer's goods transportation provider's/goods supplier's decision-making commonly includes **"industry aspects, general aspects, business owner aspects, primary stakeholder opinion/goods transportation community based aspects, marketer dominated aspects or impressions created etc"**.

GROWTH AREAS EVALUATED AND CONTRIBUTION

EFFECTIVE SUPPLY CHAIN MODEL, REACH AND MARKET PENETRATION

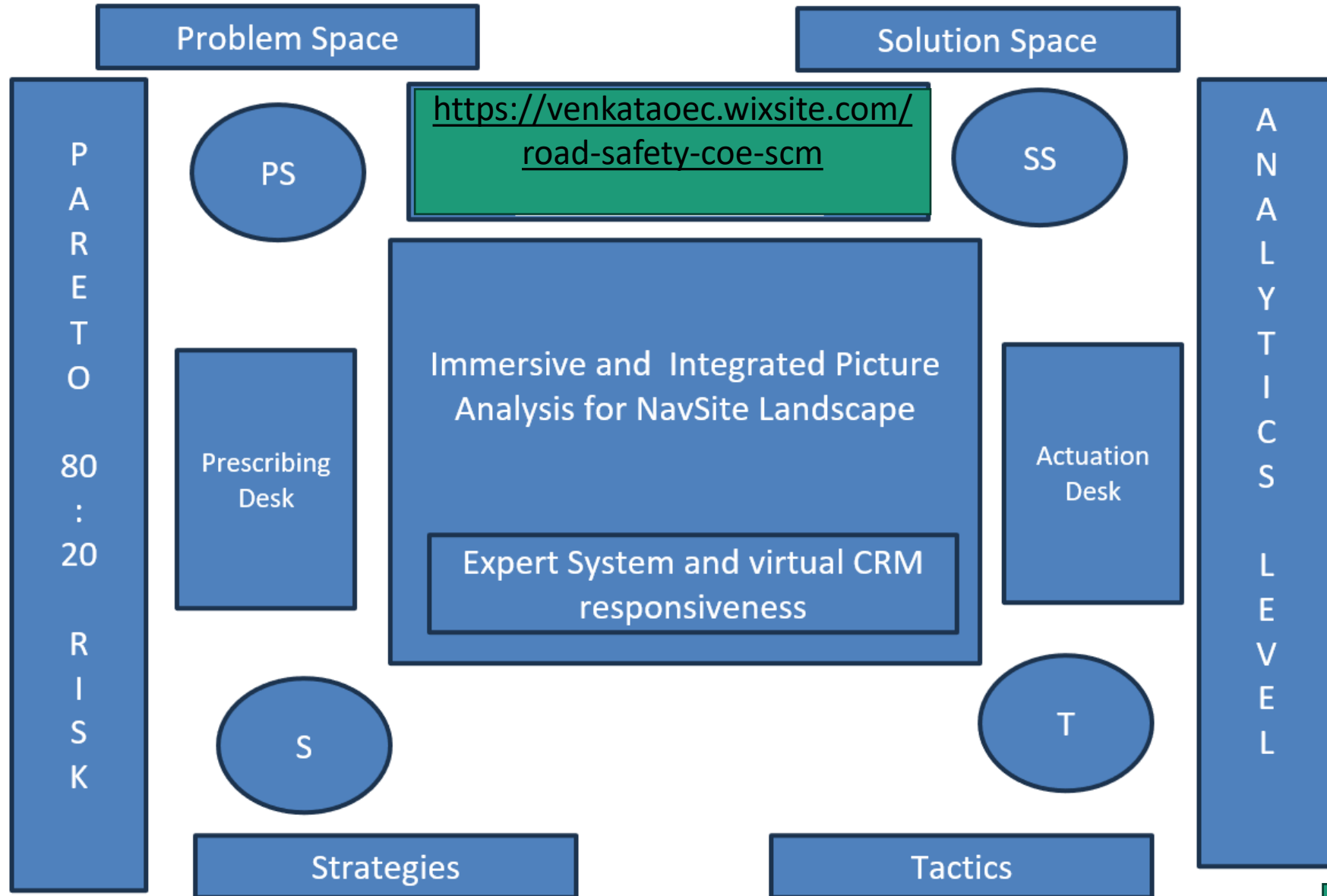


Unifying
Shpwcse

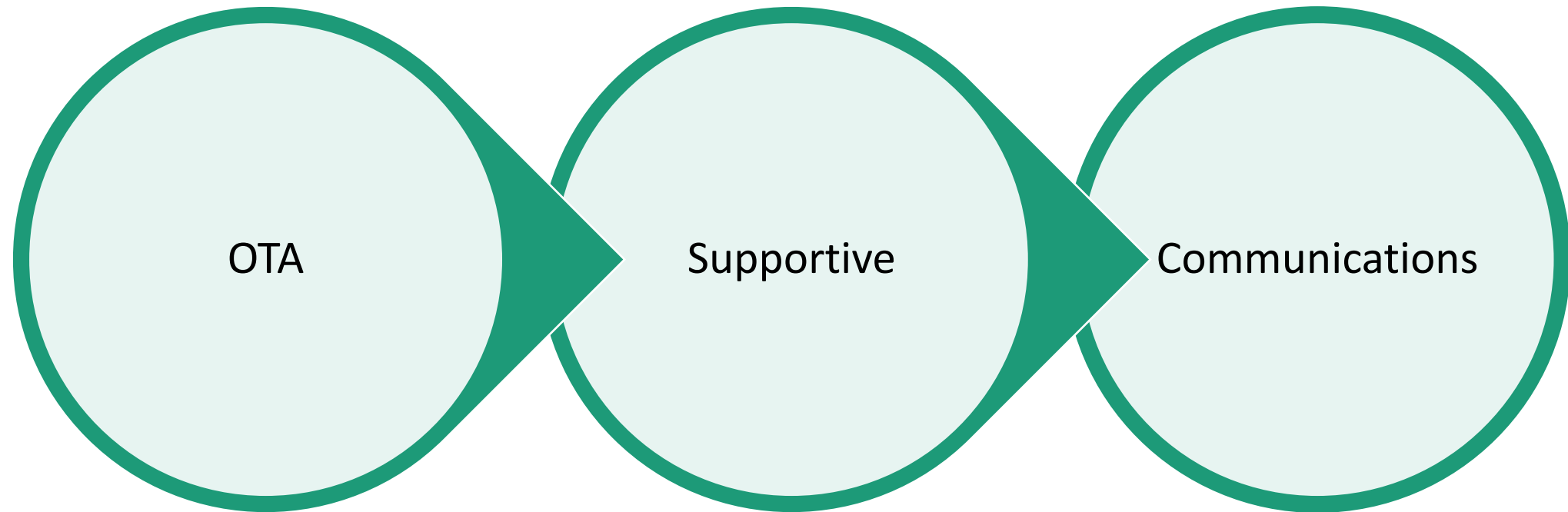


- Customer engagement
- Understanding of customer needs & benefit analysis
- Responsive manufacturing/production and service management
- Analysis of Functional or Defined Safety in context of failure, repair or replacement
- Effectively coordinating production, service-operations, systems and processes to sell the existing and upcoming products/systems/solutions
- Objective analysis and planning for climate change adversity / road system issues
- Deploying a Service Improvement Programme and Unifying Showcase & Help Desk (USHD) to implement all of the above and accentuate the domain understanding and uniqueness of brand
- Developing a Fast Track PRM (Preparedness-Readiness-Mitigation) framework to manage CCMA issues/road system dynamics that affect supply chain management related transportation and logistics

FAST TRACK PRM framework



(Road Safety/Support Planner)



Red: Primary components G: Secondary components Y: Tertiary components and B: Timeline interactive components



YOUR VEHICLE SHEET

Vehicle Sheet

- A. Exteriors
- B. Interiors
- C. Engine and Performance
- D. Battery and Battery Management System*
- E. Electric Motor and Motor Controller*
- F. Safety
- G. Comfort and Convenience
- H. Seats and Upholstery
- I. Entertainment/Multimedia
- J. Other Features and Specifications
- K. Onboard Diagnostics
- L. Added systemic intelligence (plus **editioned** Timeline Monitors)

* For Electric Vehicles amd Hybrids

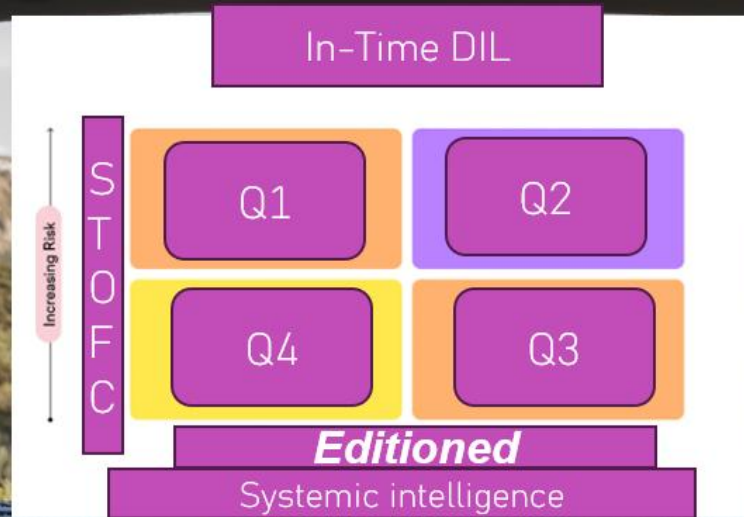
Q
1

Q
2

Q
3

Q
4

S: strategic T:Tactical
O: Operational FC Future Connected:
(Systemic Intelligence)



YOUR VEHICLE DETAILS

Vehicle Details

Vehicle Identification Number/ Vehicle
Registration Number:

Make:

Type:

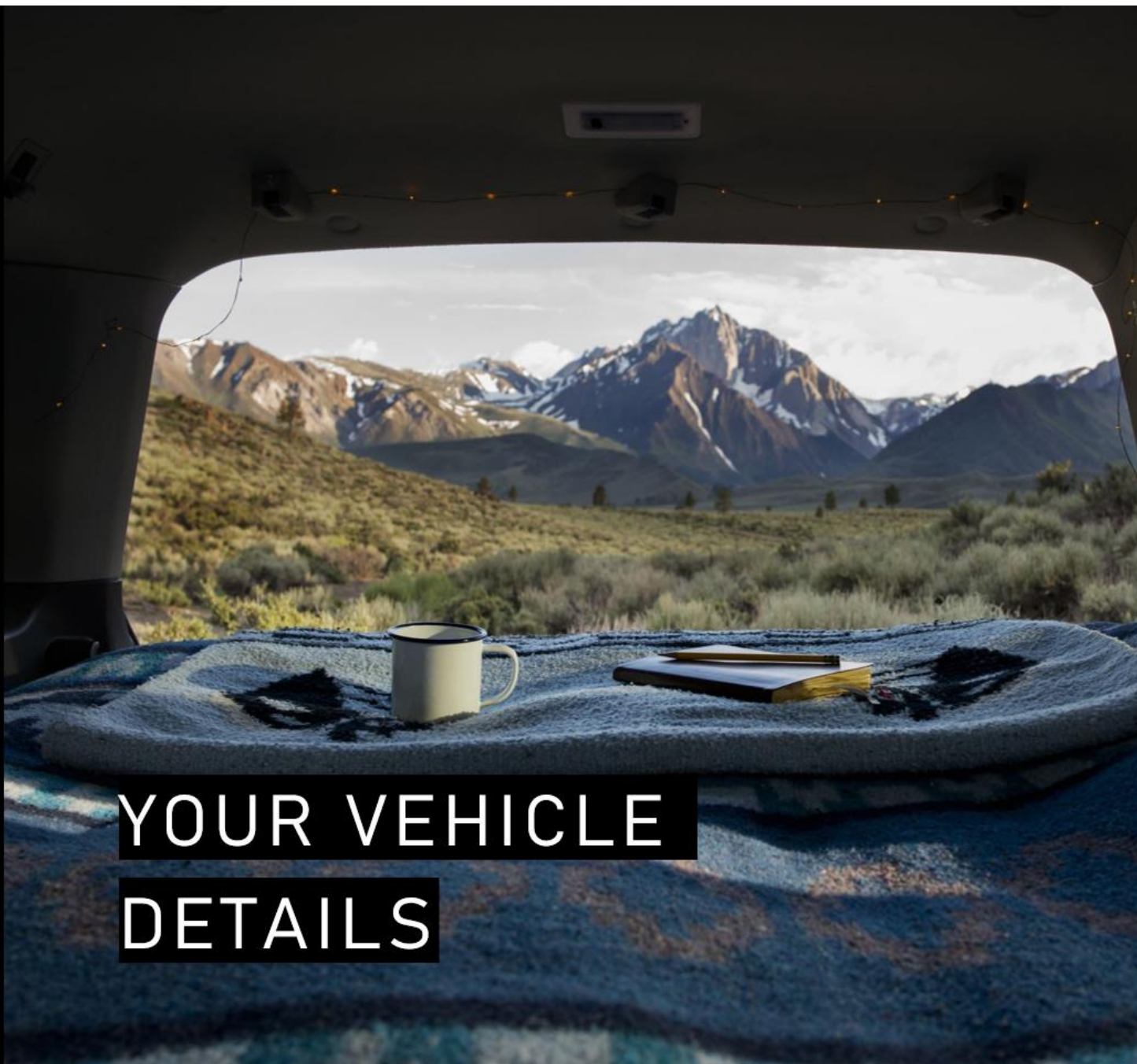
Year

Model & Variant:

TGMB Quadrants: SI (Q1/Q2/Q3/Q4)

Colour:

Petrol/Diesel/Electric/Hybrid



YOUR VEHICLE DETAILS

Vehicle Information:

Engine power (kW):

Engine number/code:

Chassis number/code:

Paint and Bodywork code:

Recommended engine oil:

OBD2 version:

In-Time DIL Edition (WIP):

YOUR VEHICLE DETAILS

Vehicle Details

*Nutshell inventory (for any Deep
Interaction Linking):*

Classification as per vehicle sheet (indexed as A to L)	Supplier code	Part code and Part description	Part fitness categories for (SAAT) Service Anywhere Anytime Ticketing or Suitability
Exteriors (TGMB Q2)			☐ Quality of information ☐ Quality of Process ☐ Quality of Outcome ☐ Quality of Service ☐ Quality Loss Function Analysis
Interiors (TGMB Q2)			☐ Quality of information ☐ Quality of Process ☐ Quality of Outcome ☐ Quality of Service ☐ Quality Loss Function Analysis
Engine and Performance (TGMB Q1)			☐ Quality of information ☐ Quality of Process ☐ Quality of Outcome ☐ Quality of Service ☐ Quality Loss Function Analysis

YOUR VEHICLE DETAILS

Vehicle Details

*Nutshell inventory (for any Deep
Interaction Linking):*

Classification as per vehicle sheet (indexed as A to L)	Supplier code	Part code and Part description	Part fitness categories for (SAAT) Service Anywhere Anytime Ticketing or Suitability
Battery and Battery Management System* (TGMB Q1)			☐ Quality of information ☐ Quality of Process ☐ Quality of Outcome ☐ Quality of Service ☐ Quality Loss Function Analysis
Electric Motor and Motor Controller* (TGMB Q1)			☐ Quality of information ☐ Quality of Process ☐ Quality of Outcome ☐ Quality of Service ☐ Quality Loss Function Analysis

YOUR VEHICLE DETAILS

Vehicle Details

*Nutshell inventory (for any Deep
Interaction Linking):*

Classification as per vehicle sheet (indexed as A to L)	Supplier code	Part code and Part description	Part fitness categories for (SAAT) Service Anywhere Anytime Ticketing or Suitability
Safety (TGMB Q3)			☐ Quality of information ☐ Quality of Process ☐ Quality of Outcome ☐ Quality of Service ☐ Quality Loss Function Analysis
Comfort and Convenience (TGMB Q3)			☐ Quality of information ☐ Quality of Process ☐ Quality of Outcome ☐ Quality of Service ☐ Quality Loss Function Analysis
Entertainment/ Multimedia (for example integration of new ideas being proposed) (TGMB Q3)			☐ Quality of information ☐ Quality of Process ☐ Quality of Outcome ☐ Quality of Service ☐ Quality Loss Function Analysis

YOUR VEHICLE DETAILS

Vehicle Details

Nutshell inventory (for any Deep

Classification as per vehicle sheet (indexed as A to L)	Supplier code	Part code and Part description	Part fitness categories for (SAAT) Service Anywhere Anytime Ticketing or Suitability
Other Features and Specifications (for example Key Convenience Fuel Quality Assistance) (TGMB Q4)			☐ Quality of information ☐ Quality of Process ☐ Quality of Outcome ☐ Quality of Service ☐ Quality Loss Function Analysis
Onboard Diagnostics (TGMB Q4)			☐ Quality of information ☐ Quality of Process ☐ Quality of Outcome ☐ Quality of Service ☐ Quality Loss Function Analysis
<i>Added systemic intelligence</i> (for e.g. Emission Warranty System, new DIL and OTA subscriptions) (TGMB Q4)			☐ Quality of information ☐ Quality of Process ☐ Quality of Outcome ☐ Quality of Service ☐ Quality Loss Function Analysis

YOUR VEHICLE DETAILS

Vehicle Details

Type of service for the vehicle:

Type of service	:Planned Maintenance for SAAT (fill details)	Preventive / Corrective Maintenance for SAAT (fill details)	Deep Interaction Link or Lifecycle Maintenance for SAAT (fill details)
Free service			
Paid service			
Subscription based services (new USHD / TGMB Q-Dashboards)			
Service plan / package based service			
Priority service			
Time of the year Programme specific service			

YOUR VEHICLE DETAILS

Typical Vehicle Management policies

1. A reactive maintenance strategy results in the reduction of the lifetime of a vehicle and also adds expense or costs in maintaining and using a vehicle.
2. Predictive maintenance helps overcome this issue.
3. Among the different types of maintenance
 - (a) Preventive maintenance is performed after a fault has occurred. It is used for infrequent failures and for parts upgradation
 - (b) Corrective maintenance is performed as breakdown maintenance
- © Predictive maintenance uses the analysis of the current condition of the vehicle to predict a failure
4. For vehicle health monitoring the typical mechatronic systems and subsystems are
 - (a) Engine (b) Gearbox (c) Brakes (d) Ignition (e) Fuel injection (f) Emission (g) Cooling (h) Battery (i) Sensors (j) Actuators (k) Other subsystems associated with electromechanical processes

YOUR VEHICLE DETAILS

Typical Vehicle Management policies

5. Engine Control Unit (ECU) controls sensors and actuators to screen and diagnose faults or problems

The ECU is also associated with the Controller Area Network (CAN) through which a distinctive subsystem and driver communicate with each other

ECU communication is done via a high-level diagnostic protocol i.e the OBD2 and UDS

The OBD2 protocol allows the vehicle to diagnose and self-report codes

The OBD framework allows a vehicle owner or repair professional to access diagnostic data about the current condition of the subsystems

The UDS provides specific details

Thereon system maintenance is done via a diagnostic and prognostic ability related to the current state and futuristic state of the system or subsystem

YOUR VEHICLE DETAILS

Typical Vehicle Management policies

6. Remote health monitoring involves the monitoring of different systems and subsystems remotely and using prognostics to predict faults in advance
7. Sequential Pattern Learning Algorithm – the algorithm learns patterns from warranty data of the vehicle and converts these patterns to a rule based expert system that helps diagnose conditions or use fault patterns
8. COSMO (Consensus self-organized models for fault detection) helps increase vehicle and parts/systems lifetimes
9. BRACID (Bottom up induction of rules and cases for imbalanced data) to deal with imbalanced data via learning classifiers
10. Kalman model to monitor vehicle health via sensor data for fault prediction and engine abnormal behavior via anomaly detection
11. Least Square Support Vector Machine (SVM) classifier for diagnostics and remote

YOUR VEHICLE DETAILS

Typical Vehicle Management policies

12. Predictive maintenance via the use of a vehicle database for storing maintenance records of vehicles visiting a workshop
13. vehicle monitoring system that monitors driver activity and status of engine via SMART phones for communications between the vehicle and back end server
14. Comprehensive analysis of vehicle's on-board and off-board data using supervised and unsupervised learning techniques using a telematics gateway
15. Multi-sensor fusion technique that monitors vehicle health using oil data and vibration signals



YOUR VEHICLE DETAILS

Typical Vehicle Management policies

16. VMMS – A real time vehicle monitoring and fault prediction system , which diagnoses main subsystems such as (a) Ignition (b) Exhaust (c) Fuel injection (d) Cooling and Other mechatronic subsystems

It uses machine learning techniques such as Decision tree, Support Vector Machine, K-Nearest Neighbor and Random Forest

It uses a SMART Phone App, OBD scanner, Bluetooth protocol to communicate DTC from scanner to SMART Phone and wireless mobile data communication from SMART Phone to the back-end server

It uses a classification algorithm for pattern learning

It relies on push notifications of abnormal condition via SMART Phone alerts or emails

17. The cost constraints in using sensor data based systems is the need for large memory space, high processor speed and custom made SMART Phone Apps

YOUR VEHICLE DETAILS

Twin Timeline
Monitors

18. Deep Interaction Link or Lifecycle Maintenance for SAAT

- As maintenance is mostly a reactive strategy for a vehicle pr fleet owned by a customer, we find certain aspects are important such as
 - (a) Predicting of remaining useful lifetimes of vehicles and their parts/ components
 - (b) Assessing the effect of remaining useful lifetimes on the cost of repairs or replacements
 - (c) Considerations of the safety of using a vehicle whose parts/ components need periodic maintenance
 - (d) Optimization of the maintenance schedule of the fleet to support objectives such as
 - (1) reduced expenses
 - (2) efficient resource utilization
 - (3) consistent service delivery via the fleet
 - (4) reduced carbon footprint
 - (5) high-performance customer experience of owning, selling or creating the brand
 - (6) TGMB KOL ANALYZERS
-

YOUR VEHICLE DETAILS

Twin Timeline
Monitors

18. Deep Interaction Link or Lifecycle Maintenance for SAAT

- For optimizing a maintenance schedule, it is important to acknowledge that each vehicle has certain parts or components that have to be maintained in a predictive and/or preventive manner based on their respective damage from wear & tear and subsequent reduction in remaining useful lifetimes.
- To optimize maintenance schedules, the common practice is to use Multi- objective Evolutionary Algorithms (MOEA) to find the Pareto optimal set of schedules
- To understand this better, in order to predict or heuristically-schedule maintenance, such an algorithm must
 - (1) identify the usage of the vehicle and driving tasks
 - (2) use a rolling time window horizon to predict the remaining useful lifetimes of parts or components
 - (3) minimize process changes between the previous maintenance schedule and the next
 - (4) help maintenance-specific estimation, spares management, and other service analytics

YOUR VEHICLE DETAILS

Twin Timeline
Monitors

18. Deep Interaction Link or Lifecycle Maintenance for SAAT

- From the (dealer's) Service Centre's or Workshop's point of view, the considerations that matter are
 - (1) maintenance estimation
 - (2) fixed setup costs and fixed schedule costs
 - (3) preparation of the Workshop for the nature of work
 - (4) resource allocation for the total workload
 - (5) spares (availability) management to control the expected number of failures or faults that the vehicle or fleet of vehicles may experience on the road
 - (6) optimization of the next maintenance schedule to reduce or control maintenance costs and workload
 -

YOUR VEHICLE DETAILS

Twin Timeline
Monitors

18. Deep Interaction Link or Lifecycle Maintenance for SAAT
- A real-time concern is that from the time a maintenance schedule is released for a vehicle or vehicle fleet, continuous changes could occur to
 - (1) the vehicle condition
 - (2) prediction of the remaining useful lifetimes of the parts or components
 - (3) responsiveness of the maintenance schedule and its objectives of meeting the TGMB benefits of buying, using and owning a vehicle
 - (4) cost variance in terms of setup costs, maintenance costs and penalty costs
 - The emerging degradation of a high investment EV or fleet of EV(s), needs in-time editioning by the manufacturer, where the end of lifecycle or need for costlier maintenance will need TGMB quadrants to be incorporated into the design and architecture of the EV to permit TGMB value enabling during and after expected lifetimes. The TGMB value enabling we propose is called TGMB Asset Creation to enable **D2L or CQI-Residual value management**

YOUR VEHICLE DETAILS

Twin Timeline
Monitors

18. Deep Interaction Link or Lifecycle Maintenance for SAAT

- Here penalty costs are based on the assumption that
- (1) if a part or component is serviced before it's due date the penalty cost is equal to the full maintenance costs
- (2) if the component is serviced on the due date the penalty costs are zero
- (3) if the component is serviced after the due date, failure expectation increases to lead to selective parts replacement or upgradation where the working out of penalty costs will need to add spares costs too

YOUR VEHICLE DETAILS

Twin Timeline
Monitors

- 18. Deep Interaction Link or Lifecycle Maintenance for SAAT
- Highlight of degradation seen in a vehicle
- Reference: Vehicle Inspection methodology used today
- (1) Degradation in the oil filter and/or air filter
- (2) Degradation in the performance of suspension and springs
- (3) Degradation of brake pads
- (4) Degradation of tyres
- (5) Degradation of chassis and it's expected condition
- (6) Degradation of engine
- (7) Degradation of the manual gear system or automatic transmission
- (8) Degradation in vehicle's ingress protection from dust and water
- For optimizing maintenance schedules, vehicle inspection status and estimation of damage or degradation is known to help.
- Here degradation of components (numbered 2, 3, 4, 5, and 6) can be calculated based on physical condition (or wear and tear) but in case of components (numbered 1 and 7) degradation occurs due to lack of periodic counter measures (or preventive maintenance).

INVENTORY TURNOVER **AND STOCK KEEPING POLICIES**

- Deep Interaction Link or Lifecycle Maintenance for SAAT
- Spares Parts Inventory Management
- DIL Analysis can help make the organization's inventory systems more responsive
- Though a dealership competes with other sane brand dealerships this function of spare parts inventory management must be measured, monitored and managed from an individual dealership point of view.
- This point of view depends upon the current automobile market, its economics and the responsiveness needed from the business's vision and operational practices
- Managing the spare parts inventory is a complex system of processes and responsibilities for driving RoI, profitability, performance and customer retention

INVENTORY TURNOVER **AND STOCK KEEPING POLICIES**

- Deep Interaction Link or Lifecycle Maintenance for SAAT
- Spares Parts Inventory Management
- The spare parts department deals with challenges such as
 - 1. Vehicle maintenance & repair intervals and requirements
 - 2. Increased dynamics or competition from the after-market, the grey market and non-OEM parts suppliers
 - 3. Increasing technology and replacements costs of parts
 - 4. Impact of parts inventory on workshop productivity, and digitally-connected service centres & shop floors etc
 - 5. Impact of eCommerce or online selling on automobile spare parts supply or sourcing

INVENTORY TURNOVER AND STOCK KEEPING POLICIES

- Deep Interaction Link or Lifecycle Maintenance for SAAT
- Spares Parts Inventory Management
- **Observations**
- For sustainable development and growth, the spare parts management systems must focus on 3 areas
- 1. Service levels
- 2. Profitability
- 3. Dealership sales
- 4. D2L Value Addition

INVENTORY TURNOVER AND STOCK KEEPING POLICIES

- Deep Interaction Link or Lifecycle Maintenance for SAAT
- **Spares Parts Inventory Management**
- Here these service levels help a dealership improve overall customer retention and in time increase market penetration via vehicles sales or repeat purchases from the dealership
- Some key metrics for improved inventory management and profitability of business are
 - 1. Days supply
 - 2. Fill rate
 - 3. Obsolescence
 - 4. Non-stock investment
 - 5. Non-stock parts usage in service or repairs
 - 6. Emergency purchases
 - 7. Lost customer numbers

INVENTORY TURNOVER **AND STOCK KEEPING POLICIES**

- Deep Interaction Link or Lifecycle Maintenance for SAAT
- In these scenarios any definition or redefinition of parts obsolescence must concern itself with associated issues such as
 - (1) Repair delays
 - (2) Additional handling
 - (3) Emergency purchases
 - (4) (Loaned) Vehicle policy expenses
 - (5) Costs to productivity
 - (6) Reduction in customer satisfaction and retention leading to reduced overall profitability

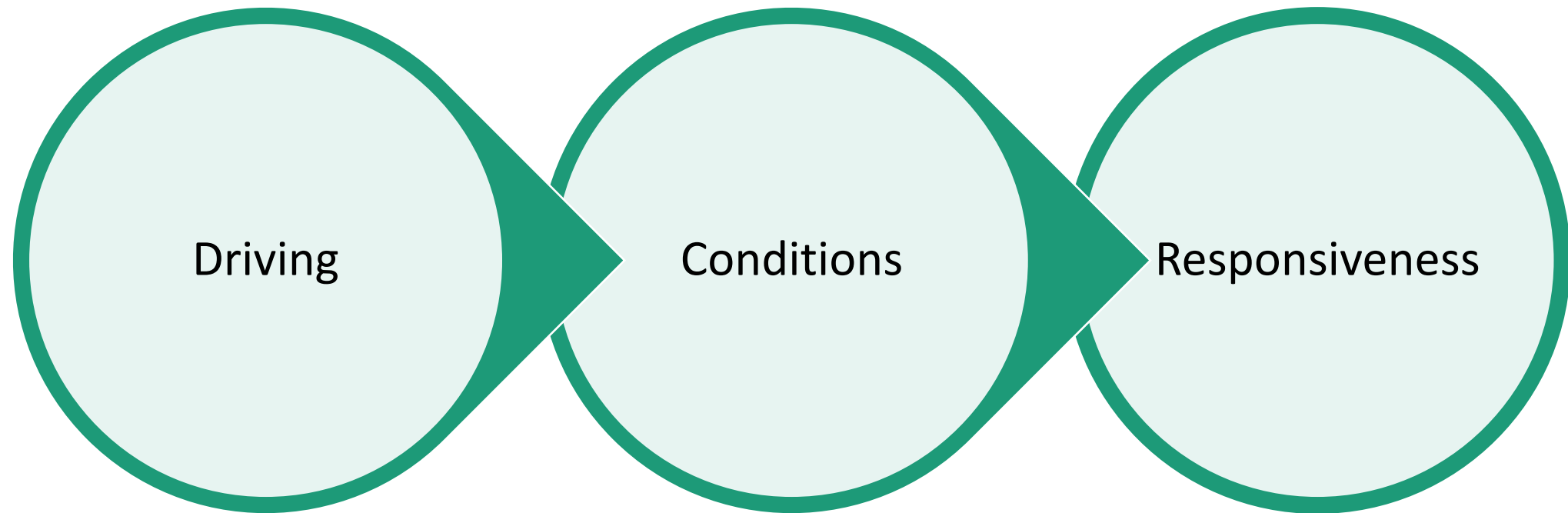
Operations Research Problems (OP-R) and Responsive Thinking



Proportionate problem
solving and assistive
analytics for signature areas



(Road Safety/Support Planner)



Drive India NSSR-RS Unit 7 (Driving conditions responsiveness)

i. An Introduction to the unit

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

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

Key Factors affecting Responsiveness

Driver Ability/Anticipatory Guidance
Driver Stress
Driver Alertness / Fatigue
Road and Traffic conditions

Drive India NSSR-RS Unit 7 (Driving conditions responsiveness)

ii. The Key Learning of the unit

To develop more driving-condition-responsiveness in an organization working in one or more wards, the training programme will help managers and employees

- ☐ Relate to the need for driver discipline and process efficiency
- ☐ Develop handbook-enablers to ensure the vehicle safety systems are in proper condition
- ☐ Add Deep Interaction (DIL) links for timely or seasonal dynamics seen in the ward's road systems
- ☐ Co-achieve for ward-centric road-system liabilities, issue raising, and faster resolution

Drive India NSSR-RS Unit 7 (Driving conditions responsiveness)

iii. The Hazards Analysis for the unit:

Driver discipline and process efficiency

Driving in dusty road conditions
Driving in road systems degraded by salt/corrosive toxins/ emissions
Driving in the condition of inflowing dust/sand/ water
Driving in mountainous areas
Towing related driving conditions
Driving in afflicted conditions (like low fuel or undue contingency or contaminated fuel, degraded parts, poor or damaged head lights, ...)
Driving in frequent stop and start conditions or brake affected conditions
Driving in sunroof affected conditions
Driving in wiper, or windshield affected conditions
Driving in dealer-network-affected conditions
Driving in Emergency Services affected conditions
Driving in out-of-network-coverage conditions
Driving in reverse gear specifically conditions
Driving in journey parameter affected conditions
Driving in non-showcased conditions

Drive India NSSR-RS Unit 7 (Driving conditions responsiveness)

iv. The expected Responses reported for the unit and it's enabling of road safety

- As maintenance is mostly a reactive strategy for a vehicle or fleet owned by a customer, we find certain aspects are important such as
 - (a) Predicting of remaining useful lifetimes of vehicles and their parts/ components
 - (b) Assessing the effect of remaining useful lifetimes on the cost of repairs or replacements
 - (c) Considerations of the safety of using a vehicle whose parts/ components need periodic maintenance
 - (d) Optimization of the maintenance schedule of the fleet to support objectives such as assessing
 - (1) Degradation in the performance of suspension and springs
 - (2) Degradation of brake pads
 - (3) Degradation of tyres
 - (4) Degradation of chassis and it's expected condition
 - (5) Degradation of the manual gear system or automatic transmission
 - (6) Degradation in vehicle's ingress protection from dust and water

Handbook-enablers to understand / connect issues to solutions
for vehicle safety systems

Drive India NSSR-RS Unit 7 (Driving conditions responsiveness)

v. Complaints commonly reported for the unit

As road systems are planned with traffic signs by project departments and the RTO, they need to be monitored for expected road safety

The monitoring is done by Concerned Civic Bodies, Traffic Guides, Pollution Level Controllers and Emergency Response & Disaster Mitigation Teams for **intervention, incidence mitigation and resolution**

The common complaints about traffic signs and their deployments on roads and routes are whether they are of right guidance-standards, insightful for road safety, of correct quality, with expected reliability, and whether they can plan for, improve or regulate responsiveness

Compounding problems adding to accident rates

•Poor Infrastructure:

•Many roads in Bengaluru are in disrepair, with potholes, uneven surfaces, and lack of proper maintenance being common complaints. Some have reduced or unregulated low visibility levels.

•Traffic Congestion:

•The city experiences heavy traffic, especially during peak hours, leading to delays and frustration for commuters.

•Lack of Connectivity:

•Some areas lack adequate road connectivity, making it difficult to travel to certain destinations.

Links for timely or seasonal dynamics seen in the ward's road systems

Drive India NSSR-RS Unit 7 (Traffic Engineering (TE) Studio Profile)

- vi. Profile for traffic engineering and accountability for traffic factors
- Road system name: Road system Id:
- Date of submission: Time of submission:
- Mapping from: Pincode: Ward:
- Mapped till: Pincode: Ward:
- Mapping pending: Pincode: Ward:
- **Type of road system:** Road/Stretch/Route/Ring road /Highway
- **Type of transportation that uses road system:** Public transport/Private transport/Pooled transport/Personal transport/Priority transport
- **Type of NSSR-RS handbook enabled accountability expected:** Regular Need/Concern/Complaint/Feedback based information
- **Type of NSSR-RS handbook enabled problem solving:** Assisting traffic signs reports/Acceptable driving conditions reports/"Audio/Video stream attached" reports/"Advanced-focus or Perspective imagery attached" reports/TE Viewpoint synergy reports/TE related value delivery reports

Drive India NSSR-RS Unit 7 (Traffic Engineering (TE) Studio Profile)

488

- **Traffic Engineering specific Work areas actively addressed:**

1	Road development and maintenance effectiveness of arterial and sub-arterial roads	Yes/No/ Not as expected
2	Junction improvement for optimizing traffic flow via signal management and road design indicators	Yes/No/ Not as expected
3	Bus Bays and Shelters construction and maintenance	Yes/No/ Not as expected
4	Traffic flow streamlining or calming through installation of humps, medians, junctions	Yes/No/ Not as expected
5	Responsiveness for Street network design to incorporate provisions for pedestrians, cyclists and amenity providers	Yes/No/ Not as expected
6	Responsiveness for Pedestrian Safety Measures like footpaths, pedestrian crossings, skywalks	Yes/No/ Not as expected
7	Public Transport Enhancement	Yes/No/ Not as expected
8	Road cutting, Duct Management, Tree cutting, and landscaping	Yes/No/ Not as expected

Drive India NSSR-RS Unit 7 (Traffic Engineering (TE) Studio Profile)

489

- **Traffic Engineering specific Work areas actively addressed:**

9	Freight Movement - Planning	Yes/No/ Not as expected
10	Freight Movement - Interrelating effectiveness	Yes/No/ Not as expected
11	Freight Movement - Supported with new idea Freight corridors	Yes/No/ Not as expected
12	Freight Movement - Supported with new idea Logistics hubs foundations	Yes/No/ Not as expected
13	Projectization for Analytics for QOI, QOP, QOS and QOO in traffic engineering, planning and organization	Yes/No/ Not as expected
14	Projectization for Analytics for QOI, QOP, QOS and QOO in road infrastructure, planning and organization	Yes/No/ Not as expected

Drive India NSSR-RS Unit 7 (Traffic Engineering (TE) Studio Profile)

490

- Road Infrastructure specific Work areas actively addressed:

1	Major Road Systems Planning and Projectization	Yes/No/ Not as expected
2	Road construction and widening	Yes/No/ Not as expected
3	Road Maintenance	Yes/No/ Not as expected
4	Drainage improvement	Yes/No/ Not as expected
5	Road Safety Measures like installing humps, medians, junctions for reducing speed	Yes/No/ Not as expected
6	Pedestrian Safety Measures like footpaths, pedestrian crossings, skywalks	Yes/No/ Not as expected
7	Key opinion Intelligence and Pincode Intelligence	Yes/No/ Not as expected
8	TMS Route Assurance and Pincode Intelligence	Yes/No/ Not as expected

Drive India NSSR-RS Unit 7 (Traffic Engineering (TE) Studio Profile)

491

- **BESCOM specific Work areas actively addressed:**

1	SMART Ward Portfolio specific	
2	Compliance criteria for timely or seasonal dynamics seen in road systems/infrastructure	Yes/No/ Not as expected
3	Effectiveness of operations and relief capacity solutions	Yes/No/ Not as expected
4	Recording and Management of incidences	Yes/No/ Not as expected
5	Recording and Management of trends of problems, and failures	Yes/No/ Not as expected
6	Recording and Management of criteria events of actively catalogued BESCOM equipment, and systems	Yes/No/ Not as expected
7	Recording and Management of criteria events of BESCOM 's catalogued energy generating / distributing inspections	Yes/No/ Not as expected
8	Recording and Management of criteria events of a Ward catalogued Solar Energy Power Systems	Yes/No/ Not as expected

Drive India NSSR-RS Unit 7 (Traffic Engineering (TE) Studio Profile)

492

- **BWSSB specific Work areas actively addressed:**

1	SMART Ward Portfolio specific	Yes/No/ Not as expected
2	Compliance criteria for timely or seasonal dynamics seen in road systems/infrastructure	Yes/No/ Not as expected
3	Effectiveness of operations and relief capacity solutions	Yes/No/ Not as expected
4	Recording and Management of incidences	Yes/No/ Not as expected
5	Recording and Management of trends of problems, and failures	Yes/No/ Not as expected
6	Recording and Management of criteria events of actively catalogued BWSSB's manholes, septic systems, drains and essential seepage/runoff/storm water management systems	Yes/No/ Not as expected
7	Recording and Management of criteria events of BWSSB 's catalogued drainage management / pattern inspections	Yes/No/ Not as expected
8	Recording and Management of criteria events of a Ward catalogued Solid Waste Management Systems and Zen for the environment systems	Yes/No/ Not as expected

Drive India NSSR-RS Unit 7 (Traffic Engineering (TE) Studio Profile)

493

- **SMART Ward Accountability specific Work areas actively addressed:**

1	TE Studio enabled Risk Mitigation and Management	Yes/No/ Not as expected
2	TE Studio enabled Condition Monitoring and Traceability	Yes/No/ Not as expected
3	TE Studio enabled Focus Analytics, Failure Mode Cause and Effects Analysis, Root Cause Analysis, Preventive management and Corrective Management systems	Yes/No/ Not as expected
4	TE Studio enabled Focus Analytics with the use of auto docking that permits exchange of visual, auditory, experiential, knowledge and learning specific criteria	Yes/No/ Not as expected
5	SMART Crisis Reduction (CR) Integration specific TR Studio Profiles	Yes/No/ Not as expected
6	SMART Ward Integration specific TR Studio Profiles	Yes/No/ Not as expected
7	SMART Buildings/Facilities Integration specific TR Studio Profiles	Yes/No/ Not as expected
8	SMART Organization Integration specific TR Studio Profiles	Yes/No/ Not as expected

Drive India NSSR-RS Unit 7 (Traffic Engineering Studio and the Proposed Track Report)

- vii. Reporting a complaint about accountability for traffic factors
- Road system name: Road system Id:
- Date of submission: Time of submission:
- Mapping from: Pincode: Ward:
- Mapped till: Pincode: Ward:
- Mapping pending: Pincode: Ward:
- **Type of road system:** Road/Stretch/Route/Ring road /Highway
- **Type of transportation that uses road system:** Public transport/Private transport/Pooled transport/Personal transport/Priority transport
- **Added commuting systems:** Overhead Metro/Underground Subway/Tram
- **Current Risk Health:** Assisting signs satisfactory/Acceptable driving conditions/Other reports/Do not know
- **NSSR-RS handbook enabled Health details:** ...

Drive India NSSR-RS Unit 7 (Driving conditions responsiveness) – Proposed Track Report

- Reporting a complaint about accountability for traffic factors
- Traffic signs concern/ issues with driving in poor conditions:
- Associated images (to be uploaded in.jpeg format with details on location):

Drive India NSSR-RS Unit 7 (Driving conditions responsiveness) – Proposed Track Report

- Reporting a complaint about accountability for traffic factors
- **Nature of congestion (Rated as important KOI specific negative influences):**
 - () Perennial congestion
 - () Seasonal congestion
 - () Time-based congestion
 - () Incidence specific congestion
 - () Feeder Traffic specific congestion
 - () Goods/Freight movement specific congestion
 - () Congestion due to other influences / conditional dynamics

Impact on

- ☐ Sustainable Development & Growth
- ☐ Socio Economic Solutions
- ☐ Traffic Control
- ☐ Supply chaining
- ☐ TMS Logistics
- ☐ Environmental quality
- ☐ Incidence Response / Mitigation
- ☐ Fire fighting (amenity specific) / Fire Department response

Drive India NSSR-RS Unit 7 (Driving conditions responsiveness) – Proposed Track Report

- Reporting a complaint about accountability for traffic factors
- **Required Pincode Intelligent Signage deployed to mitigate risks to commuters or people**
- () **Road signs identifying traffic safety norms** (signage about sharp curves, bends, gradients, narrowing, low visibility zone, low height clearance and load levels)
- () **Signage for accident relief, emergency response and assistance** (like contact information for the nearest “ambulance services, hospital, police station, fire department, disaster management department”, associated civic body)
- () **Signage and barricades around (perimeter) of potholes, poor quality manholes and septic systems**
- () **Signage with precautionary and must know information about ring road, flyover, bridge, tunnel, subway, metro track, tram track, and level crossing**
- () **Other issues impacting unregulated driving/track report:**

Drive India NSSR-RS Unit 7 (Driving conditions responsiveness) - Proposed Track Report

NSSR-RS-Id:

Date of TMS Route Assurance report:

Time of report:

() Quality levels

Details: For example “**Good/Moderate/Poor/Hazardous**” with added details

() Traffic volume levels

Details: For example “**Heavy/Moderate/Low volume/Controlled**” with added details

() Pollution levels

Details: For example “**High/Moderate/Normal/Uncontrolled**” with added details

() Accidents or incidence (even crimes) trends

Details: For example “**High/Moderate/Rare/Controlled**” with added details

() Possible route diversions

Details: For example “**Arterial arrangement/Alternate deviations/Service roads/Flyovers/Recommended by intervention diversions**” with added details

() Commuter comfort levels (specific to Commuter profile)

Details: For example “**High volume related stress levels/Moderate volume related stress levels/Normal volume related stress levels/Uncontrolled volume related stress levels/Repair work related stress levels/Breakdown of vehicles related stress levels/Ambulance or Emergency Response or Special need vehicles related stress levels/Climate change related stress levels/Disaster conditions related stress levels/Escalated tension related stress levels...**” with added details

Drive India NSSR-RS Unit 7 (Driving conditions responsiveness) - Proposed Track Report

() Availability of alternate transportation services

Details: For example **“Overhead Metro/Underground Subway/Tram”** with added details

A Votary Track is a Road System that is being reported about for NSSR-RS responsiveness

() Availability of emergency response services

Details: For example **“Equipped with first aid provisions/Has clearance for air lift/Equipped with fire extinguishers/Equipped with smoke alarm systems/Equipped with sentinel sensors”** with added details

() Afflicted due to weather forecasts

Details: For example **“Harsh weather conditions, high ambient temperatures, poor quality of air, low visibility levels, high speed wind velocity, heavy rainfall leading to flood like situations, water logging, overflowing of sewage drains”** with added details

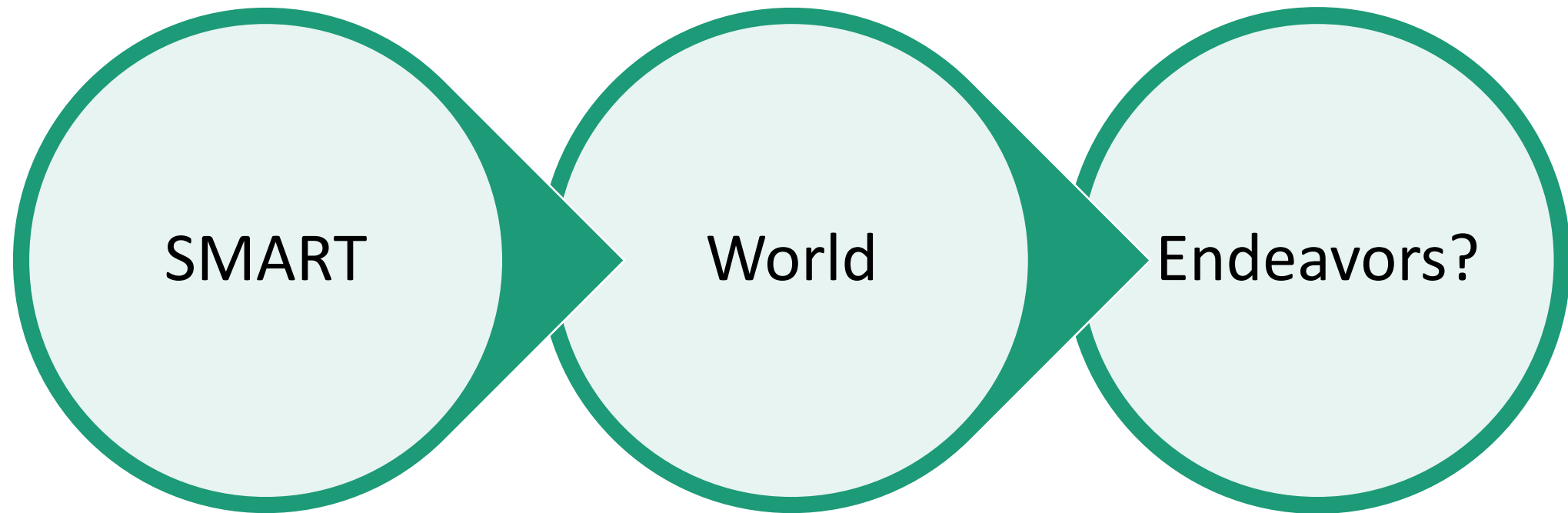
() Vital network and signal coverage

Details: For example **“Normal Votary Track connectivity/Failing Votary Track connectivity/Problematic Votary Track connectivity/ Normal Emergency Response connectivity/ Failing Emergency Response connectivity/ Problematic Emergency Response connectivity/Good quality signal strength reported for most mobile services/Complaints recorded for most mobile services/Poor quality signal strength due to weather forecasts”** with added details

() Vehicle indicators

Details: For example **“Normal for road system configuration/ Problematic for road system configuration/ Problematic for unmapped road system configuration/Complaints recorded for road system configuration”** with added details

SMART PROFILES FOR QUALITY PROMOTION OR ASSET DEVELOPMENT



NEWER SMART PROFILES



Service
Anywhere
Anyhow



NSSR RS* Family Advancement

Asset Development

SMART Profile Integration with a COPQ Project Centre

Know your (End Of Year 25) need Questionnaire

- The Likert scale to be considered as

- 1 – Satisfied
- 2 – Dissatisfied
- 3 – Partially satisfied
- 4 - Neutral

- OR

- 1 – Yes
- 2 – No
- 3 – Partially Yes
- 4 - Neutral

- On a scale of 1 to 4, 1 being satisfied and 3 being partially satisfied, indicate which level is your firm's objective analysis and planning for each of the following dimensions/measures as compared to what your management perceives or actually considers as possible amidst national objective, social and management influencers



Objective analysis and planning needed for climate change adversity / road system issues in transportation and logistics for supply chain management, where our team finds the highlight to be the most common answer

Know your (End Of Year 25) need Questionnaire

- Q1: Is travel to the HO, the business units, the supply chain warehouses / stores and back a simple experience or is it concerning?
- Rating: Yes/ No/ Partially yes/ Neutral
- Q2: Is this travelling done using one decided-upon-system or via different means or alternatives (where open-ended costs are of a concern)?
- Rating: Yes/ No/ Partially yes/ Neutral
- Q3: Do the staff feel they can communicate responsibly or give responsible feedback about issues in the travel mentioned in Q1 and Q2 and find solutions?
- Rating: Yes/ No/ Partially yes/ Neutral
- Q4.1: Does the management think that this work enabling travel, using a two-wheeler, four-wheeler or commercial vehicle like an auto/van/minibus/bus is a safe solution or will timely code of conduct help??
- Rating: Yes/ No/ Partially yes/ Neutral

Know your (End Of Year 25) need Questionnaire

- Q4.2: Does the management think that supply enabling travel, using a commercial vehicle or material/goods/cargo transportation vehicle is a safe solution or will timely code of conduct help??
- Rating: Yes/ No/ Partially yes/ **Neutral**

- Q5: Does the management think vehicles used to travel to the HO, the business unit, the supply chain warehouses / stores and back are safe, fit and efficient or does the team think unified feedback for improvement or modernization will help?
- Rating: Yes/ No/ Partially yes/ **Neutral**

- Q6: Does the management think updated traffic rules, traffic signs and guidelines for reasoning are needed to help this travel to the HO, the business units, the supply chain warehouses/stores and back?
- Rating: Yes/ No/ Partially yes/ **Neutral**

Know your (End Of Year 25) need Questionnaire

- Q7: Does the management think penalties paid or discussed to discipline traffic rule violators are supportive for safe travel or does the team think the problem is related to accountability and responsibility by the transport authorities, Organization/business/organization, “decision-making” transport services department/team, “timely or emergent knowledge, learning and innovation-driving” faculties, workforce and the “Driving conditions” respondents?
- Rating: Yes/ No/ Partially yes/ **Neutral**

- Q8: Does the management think a “Road Safety Planner” to travel to the HO, the business unit, the supply chain warehouses / stores and back can highlight essential “knowledge, learning and criteria needed”?
- Rating: Yes/ No/ **Partially yes**/ Neutral

- Does the management think that the business centre or a collective responsibility “Road Safety” portal can host handbooks/guides/empirical studies to help make travel safe, responsive and sustainable?
- Rating: Yes/ No/ **Partially yes**/ Neutral

Know your (End Of Year 25) need Questionnaire

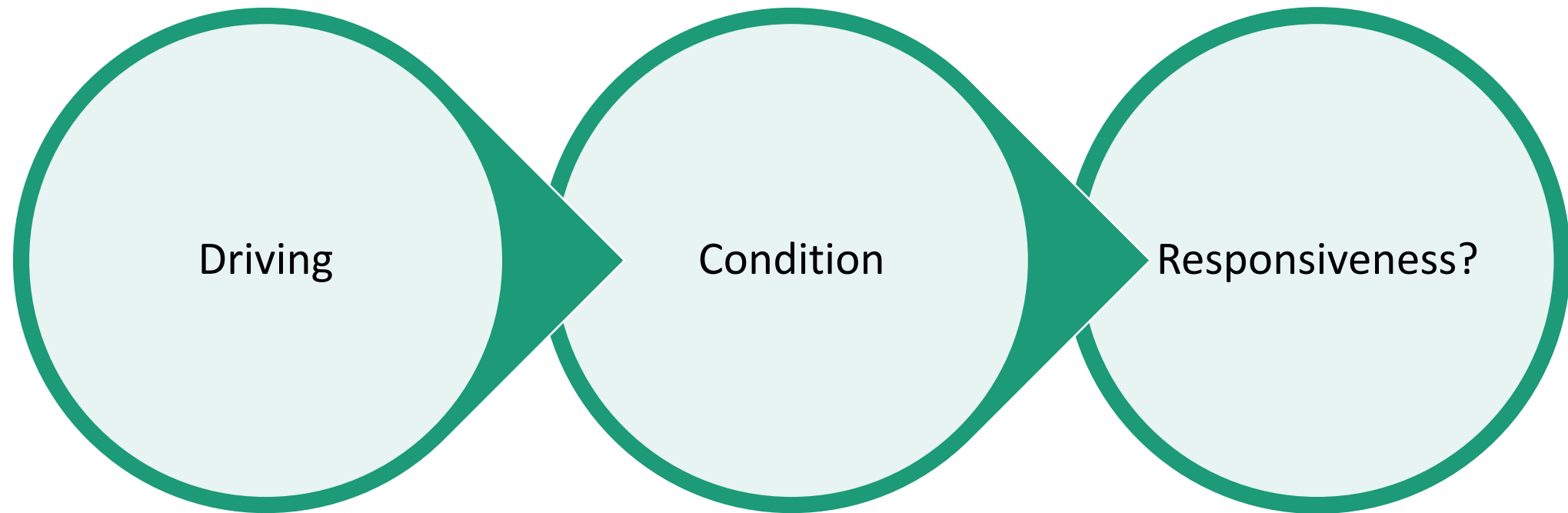
- Q9. Does the management think that the routes taken or scheduled are going to need more quality promoting details for drivers and vehicles, where problem-solving-project-based studies or **Road Safety/Support Planner-Actuation** can help solve some elements of the safer travel/transportation problem?
- Rating: Yes/ No/ Partially yes/ **Neutral**



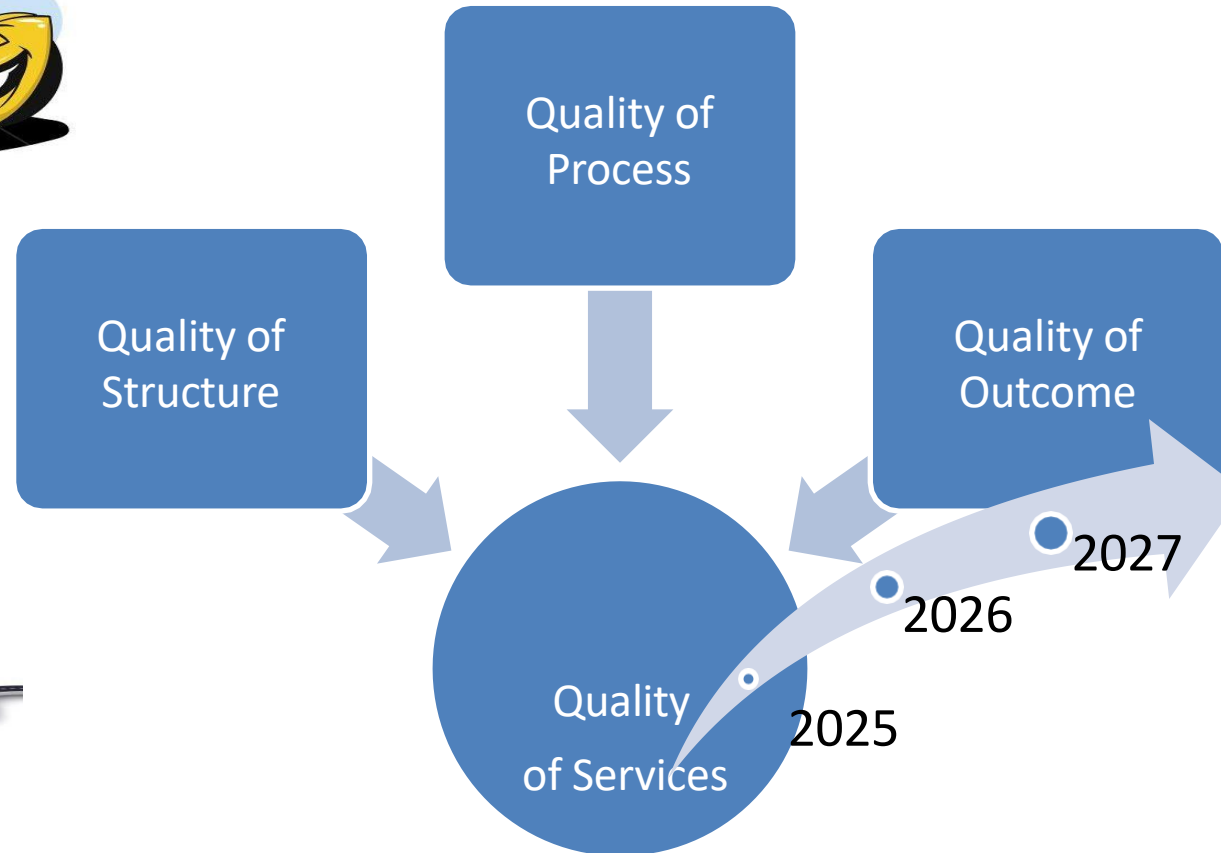
Know your (Dec 25) need Questionnaire

- Q10. Does the management think that proportionate time spent in reviewing, evaluating and conducting of assisting project-studies can improve the transportation problem or transport-services-foundation for your HO, the business units, the supply chain warehouses/stores, business associates, mission critical partners/associates – where your business or associates are expecting seen or newer problems, or experiencing added costs or ease-of-travel imbalance in the logistics in travelling to business units and back?
- Rating: Yes/ No/ Partially yes/ **Neutral**
- The Know your need Questions are a part of **monthly bulletins** to step up any solution finding for a
- Road Safety/Support Team/Department, where **Quality Promotion or Asset Development SWOT(s)** are actively recommended to be actively deployed via the investor business/organization.
- Or if this is not possible, the solution finding can be editioned in a “Road Safety/Support Planner – Case study or Empirical study” that develops route editioning/ route Impact mitigation for the HO, the business units/the supply chain Warehouses/stores, and the associate businesses ...

ROAD SAFETY/SUPPORT PLANNER – EXCERPT FOR DRIVE INDIA UNIT 7



Driving Conditions Responsiveness and Commuter Safety



Commuter Safety

A. What are the hazardous factors for commuter safety?

There are many different factors such as

1. Sudden bends or curves with or without signs, where it is not possible to ensure clear visibility
2. Under repair roads with or without signs
3. Sudden Traffic signals with or without signs
4. Sudden Pedestrian crossings with or without signs
5. Sudden Speed breakers with or without signs
6. Unmanned Road Medians or missing Bordering Road Barricades with or without signs
7. Road deterioration and potholes

Commuter Safety

8. Poorly maintained septic systems and manholes
9. Traffic violators and lack of driving norms
10. Hotspots (locations that need converged administration to address the need to mitigate climate change, rising pollution levels, rising CO2 levels, poor air quality, accident trends, traffic problems, incidences of crime, issues with road system arboriculture. At these locations parameters such as MTTD, MTTP, MTTN & MTTR and feedback loops all decide the balance)
11. Lack of self-assessments of driver fitness with drive guidance
Note on drive guidance: It is an advisory for a road system that is developed on the basis of the nature of planning for the road system
12. Lack of feedback systems that alert or mitigate risks and hazards
13. Controlling crime in taxis, autos, mini vans, mini buses and buses via a Commuter Safety Framework (proposal should be taken up with the Commissioner of Police)

(1) Sudden bends or curves – A Hazard



(2) Sudden Road under repair conditions— A Hazard



(3) Sudden Traffic signals – A Hazard



(4) Sudden Pedestrian crossings – A Hazard



(5) Sudden Speed breakers – A Hazard



(6.a) Unmanned road medians – A Hazard



(6.b) Un-barricaded roads – A Hazard



(7) Potholes – A Hazard



(8) Septic System & Manholes – A Hazard



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(9.a) Lack of Occupation based Driver assessment – A Hazard

- Lack of self-assessment of fitness of drivers of passenger vehicles
- Lack of self-assessment of fitness of drivers in occupations that influence or affect overall traffic safety
- Lack of self-assessment of a driver's continual awareness of needful norms for passenger and pedestrian safety
- Lack of self-assessment of a driver's continual sensitivity towards passenger and pedestrian safety



(9.a) Lack of Occupation based Driver assessment – A Hazard (UK edition)

Homepage Language Setting Help Desk

Add New Self-assessment on the basis of what is done in different countries

Please update information. The first name and last name should be entered exactly as it appears on driver's licence.

Personal Information	
First Name:	
Last Name:	

Online Training Information	
Self review	☒ YES
Type of vehicle	
Awareness of norms for	- Seat Belts - Roundabouts - Junctions - Deadly Distractions - Speeding - Lane Changes - Escape Routes - Weather Conditions - Weather Conditions - Car Parks and Reversing - Drowsy Driving - Safe Motorway Driving - How to Spot and Avoid Failure to Give Way Collisions - Safe Driving In Road Works - Alcohol, Drugs And Driving - Sharing The Road With Large Lorries - Safe Driving At Night - Avoiding Collisions With Pedestrians And Cyclists - Safely Navigating Rural Roads - Green Driving
Votary	Perception Evaluation
	Hazard Perception Evaluation
	Rating
Submit Information Reset Drive guidance	

(9.b) Lack of Occupational Therapy based driver assessment – A Hazard

- Lack of focus on the impact of a person's hazardous habits, medical condition or even afflicted ability on commencing or returning to driving
- Lack of any regular assessments to be conducted by an Occupational Therapist unit in a supportive environment that aims to ensure whether afflicted people are safe and able to drive, where possible



(10) Traffic violators or lack of common driving norms— A Hazard



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(11) Lack of feedback systems – A critical requirement

- Traffic signals and vigilant traffic control mechanisms are the only systems that currently guide traffic movement on roads. There is a critical requirement for feedback systems that can guide drivers, commuter behavior and traffic movement. Some examples of feedback entities* being (1) Road Safety and Commuter Safety App(s), (2) Road Safety LiveUpdates and Commuter Safety LiveUpdates, (3) (Futuristic) Sensor enabled alarm systems, (4) (Futuristic) Sentinel screening and updates and (5) Self-assessment of fitness and driver guidance



(12) Controlling crime in taxis and in private ride operators

- Developing a Customer Safety Account and Control Room framework that mandates pre-ride & post-ride assessments with on-board surveillance & alarm systems that help commuters report feedback, concerns, complaints and also mitigate possible risk or incidence of crime



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Commuter Safety

Form Serial No:

Date:

Name of road system :

Road ID:

Vehicle Registration No:

Feedback entity* reporting problem:

Name of road maintenance company (if known):

Feedback
Photograph

Annual Maintenance Contract No (if relevant):

Nature of inspection or assessment:

With GPS turned on

☐ **Photograph taken and sent** (for accountability or to improve road safety)

☐ **Hazardous factors such as the 1 to 12 issues highlighted**

☐ **Location analysis** (condition of road, whether there is sufficient prior intimation for “traffic signals, pedestrian crossings, speed breakers or road humps, accident zones, road repair scenarios, zones with displaced traffic”, manned road medians, clear visibility and safe navigability with sufficient lighting)

☐ **Signage for emergency services** (whom to contact for this road system and notification as to what should be done if there are incidents of accidents or other health hazards)

Commuter Safety

Evaluation of reason for hazard:

- ☐ Poor quality road construction
- ☐ Poor quality repair work
- * +Poor quality “preventive maintenance of road”
- ☐ Road affected by water bodies or drainage structures
- ☐ Damage due to natural or man-made disaster occurrence
- ☐ Sudden bends or curves with or without signs, where it is not possible to ensure clear visibility
- ☐ Under repair roads with or without signs
- ☐ Sudden Traffic signals with or without signs
- ☐ Sudden Pedestrian crossings with or without signs
- ☐ Sudden Speed breakers with or without signs
- ☐ Unmanned Road Medians or missing Bordering Road Barricades with or without signs
- ☐ Road deterioration and potholes
- ☐ Poorly maintained septic systems and manholes
- ☐ Traffic violators
- ☐ Hotspots
- ☐ Lack of feedback systems that alert or mitigate risks and hazards
- ☐ No self-assessment of driver fitness
- ☐ No drive guidance

Commuter Safety

Classification of median or bordering road barricade (according to the road system):

- [] Unmanned median or bordering road barricade
- [] Low clearance median or bordering road barricade
- [] Raised median or bordering road barricade
- [] Damaged or under repair median or bordering road barricade
- [] Other median or bordering road barricade issues
- [] Manned via sensors medians or bordering road barricades

Evaluation of action needed:

- [] **Immediately notify owner or driver of vehicle (issue new drive under instruction notices)**
- [] **Immediately ensure safety, prevent accidents and health hazards**
- [] **Issue or put up sufficient prior signage and public notifications for hazards**
- [] **Check for road utilization problems** (traffic violation and displaced traffic)
- [] **Check for seepage** (due to nearby water bodies or drainage structures)
- [] **Categorize nature of passenger vehicle or pedestrian safety** (like signage intimating that “crossing is hazardous, accident zone, unrestricted speed limit”, signage indicating unmanned medians, need for the incorporation of SMART Meters, manned medians & bordering road barricades and alarm systems)
- [] **Incorporate MIR Sentinels (or SMART Meter systems) with auxiliary systems**

Commuter Safety

Why are ideas for improving road safety emerging today?

The need for feedback systems is a known and critical requirement, but the exercise to install multi-purpose sensors and alarm systems is a challenging and sustainable “Road infrastructure” mission.

To get started, the Road Safety proposal states that the baseline version of feedback systems can first include:

- ☐ (App based) Quality analysis of Manned Road medians and bordering Road barricades
- ☐ (App based) Quality analysis of manholes and septic systems
- ☐ (App based) Quality analysis of potholes and speed breakers
- ☐ (App based) Quality analysis for pedestrian safety
- ☐ (CCTV & App based) Analysis of traffic signal performance for safety
- ☐ **(App based) Self-assessment of driver fitness****
- ☐ **(App based) Tracking to control and respond to crime in taxis, private & public transport vehicles****

**** This proposal to the Commissioner of Police**

Commuter Safety

Reason for road inspection or assessment (Tick as applicable):

- | | |
|--|---|
| ☐ Accidents or Health hazards | ☐ Complaints about safety |
| ☐ Emergency call or disaster | ☐ Aging of road infrastructure |
| ☐ Preventive maintenance | ☐ Routine assessment |
| ☐ Feedback system trends | |

Complaint No:

Priority Complaint No:

Time taken:

Record of inspection:

Date	Nature of inspection	Details of inspection	Next scheduled date	Done by

Commuter Safety

Record of condition:

Date	Condition	Details of condition	Analysis of condition	Plan of action	Done by

Record of repairs:

Date	Nature of repairs or cleaning	Details of repairs or cleaning	Cost of repairs or cleaning	Reordering Of material	Done by

Commuter Safety

- **Record of road's performance (Tick as applicable):**
- ☐ No complaints ☐ Pedestrian safety proper and adept
- ☐ Occasional complaints ☐ Road safety proper and adept
- ☐ Recent complaints ☐ Feedback system proper and adept
- ☐ Complaints since a long time
- ☐ Rising number of complaints
-
- **Current problem or complaint or observation?**
-
- **Whether subsequent actions were taken?**

Commuter Safety

- **Whether Corrective Action was outlined? (Yes/No)**
 - **Details:**
- **Whether Preventive Action is planned? (Yes/No)**
 - **Details:**
- **Whether Grievance Redressal was necessary? (Yes/No)**
 - **Details:**
- **What will be done to prevent re-occurrence of problem or issue?**

Subscription Index	Subscription Name	Details	Amount (in INR)
RSS-SUB-1A	Road Safety Planner	Electronic version of the Road Safety Planner with connected distribution rights for the organization	1,000
RSS-SUB-1B	Road Safety Planner and Road Support plus Ally Planner	Electronic version of the Road Safety Planner and Ally Planner with special distribution rights for the organization	Work in progress
RSS-SUB-2A	Active Biz programme for Road Safety Intelligence	Electronic version of the RSS Planner with connected distribution rights for the organization with monthly bulletins of COPQ issues and NSSR objectives	10,000 to 15,000
RSS-SUB-2B	Active Co-achieving programme for Road System Infrastructure	Electronic version of the Ally Planner with connected distribution rights for the organization with monthly bulletins of COPQ issues, NSSR objectives and NSSR Ally services for condition monitoring and reporting	Work in progress
RSS-SUB-3A	Active In-time COPQ-P-CENTRE (Support Centre) programme	Subscription URL:	Work in progress
RSS-SUB-3B	Active In-time COPQ-Q-CENTRE (Support Centre) programme	Subscription URL:	Work in progress

Subscription Index	Subscription Name	Details	Amount (in INR)
RSS-SUB-4A	Active In-time COPQ-P-CENTRE (Support Centre) programme plus Case Studies and Empirical Studies	Subscription URL: Case studies URL: Empirical studies URL:	Work in progress
RSS-SUB-4B	Active In-time COPQ-Q-CENTRE (Support Centre) programme plus Case Studies and Empirical Studies 	Subscription URL: Case studies URL: Empirical studies URL:	Work in progress
RSS-SUB-5A	Accelerator COPQ-P-CENTRE (Support Centre) programme plus E2L, Asset Development, Dashboards and Reports	Subscription URL: Accelerator URL:	Work in progress
RSS-SUB-5B	Accelerator COPQ-Q-CENTRE (Support Centre) programme plus E2L, Asset Development, Dashboards and Reports	Subscription URL: Accelerator URL:	Work in progress

QR code for subscription
payments

Detailed invoice for subscription
based case studies/empirical
studies and dashboards

