DEVPOST NOV 2025 HACK THE TRACK SUBMISSION

SMART Resolution of DPD issues or incidences for a Race

SOLUTION:
D2P Accentuator for using Toyota GR Data sets and SMART resolution for Drive performance dimensioning

D2P ACCENTUATOR ANALYTICS

BY

VENKATRAM K S & AAKKASH K V

AOEC 2025-2026

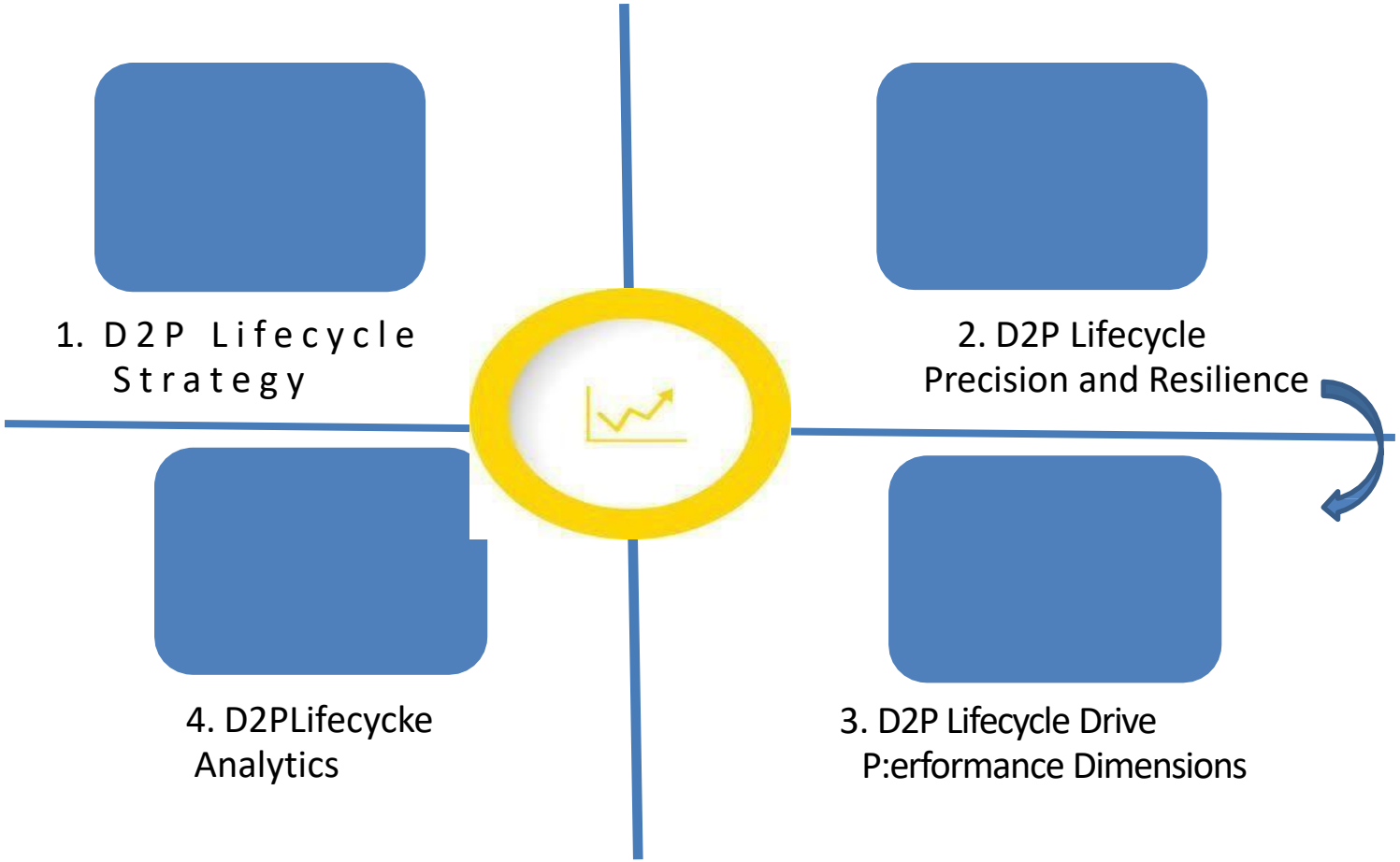
DATA SETS
SONOMA
RACE1
AND
RACE2

Performance for a podium finish

- **AOEC finds that for podium finish, the manufacturer, driver & co-driver team, race engineering team, drive performance dimensions D2P team** need to fine focus and design capability for the following D2P Accentuator workflows

Drive performance dimensioning

Road Surface, Distance, Drive time, and Correlation for Responsiveness, Performance and Reliability



D2P Lifecycle AND 5R(S)

Relate

Respond

Reduce Risk

Reciprocal Race insights

TMS Resilience for lap / rally designed RADIUS and CIZ

CIZ : CRITICAL INTERACTION ZONE IN A LAP/RADUIUS OF RACING

Performance for a podium finish

- AOEC finds that instrumentally, the Data to Performance (D2P) Lifecycle must define a
- workflow for accentuating
- 1. The Rally/Race track Landscape
- 2. Pre-event forecasts of the KEY PERFORMANCE INDICATORS
- 3. Pit stop Work SMART(ness) as per the rally or race track
- 4. Driver and Co-driver team SMART(ness)
- 5. 5R(s) SMART(ness) for a podium finish

CRITICAL INTERACTION DETERMINERS

ROAD SURAFCE COVERINGS, LIGHT / SHADE ISSUES, CURVES, MEANDERS, INCLINES, BOTTLENECKS, CLOSE PROXIMITY REGIONS

SMART(ness) :

SPECIFIC CRITICAL INTERACTION FOR MEETING NEED WITH APPLICABLE INSIGHT RESPONSE AND TEMPERAMENT

Data sets

EXPERT SYSTEM

SPHERE OF CONTROL, FOCUS, CAPABILITY AND INGENUITY

TIME MOTION SCA;LE / POINT SLOPE INTERCEPTION

Sampling elements

Performance for a podium finish

CRITICAL INTERACTIONS

EXPECTED COMPETITIVENESS, PROBABLE INCIDENCE/HAZARD/ RISK/RULE COMPLIANCE, PRECISE DRIVING, ENDURANCE DRIVING, INTERCEPTING CURVES, MANEUVERING OPTIONS, RESPONSE, RAPID RESPONSE, FLAGGING FOR PIT STOP WINDOWS, EMERGENCY RESPONSE / SPECIFIC NEEDS

Performance for a podium finish

- Expert system SMART(ness) for data sets and virtual POINT SLOPE INTERCEPTION can make it simpler to identify the tangible correlation between drive performance dimensions of a rally/race track with the Drive to Performance Workflow to help and improve driving performance for a podium finish.

- This D2P Workflow plus D2P teamwork can
- Record-or-review,
- Relate,
- Reduce risk,
- Reciprocate response and
- Rally Resilience for a D2P RADIUS that happens to matter for a rally/race and its dimensions like the race track/road surface, distance, drive time, perform with reliability factors, where there is agile part-lifetime mitigation via strategic displays/condition monitoring/traceable fault tolerance/preventive and corrective action, where this new Workflow development can help a racing team categorize a D2P index for a rally/race track/TMS radius, where the index can be simply (1), (2), (3), (4) or combinations of them

Performance for a podium finish

- **(1) D2PI1:=** where this workflow will need to address History of interaction & **Foreseeable needs** and 5R(s)
- **(2) D2PI2:** = this workflow will need to address **Critical Interaction Zone** needs and 5R(s)
- **(3) D2PI3:** this workflow will need to address **Road/Race-track dynamics** and 5R(s)
- **(4) D2PI4:** this workflow will need to address A**dvanced AGILITY needs and 5R(s)** (like air quality, rotational/unregulated acceleration, temperature/humidity, race track or road or terrain safety, with more than expected driving style for event roadmaps, reliability and performance and more than programmed drive distribution between the front and rear wheels as expected in 4WD modes)

Performance for a podium finish

- The D2P Data Analysis Channel Building for a manufacturer, the driver and co-driver team, the race-engineering team and the D2P Accentuator team for new or revised drive to performance dimensioning of the needed SMART(ness for a podium finish), will need to

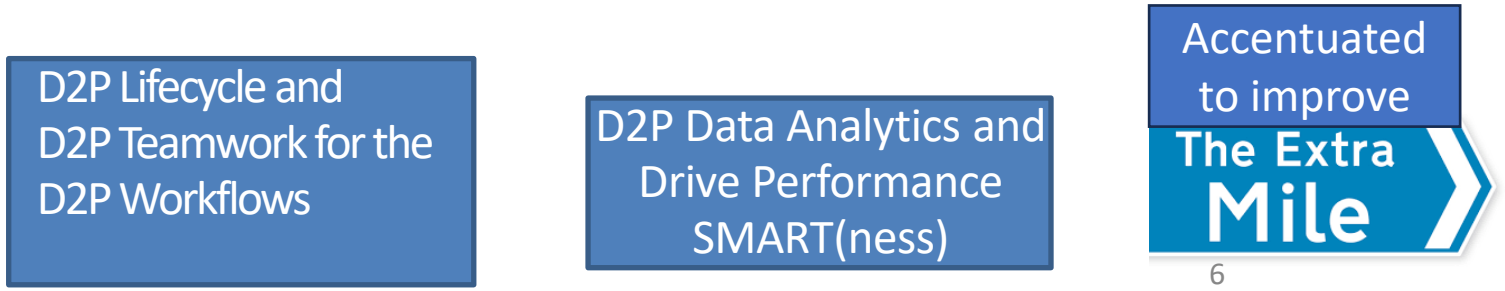
- **1. Enable D2P strategy for performance for the race category**

- **2. Develop D2P channelization for D2P lifecycles, workflows and teamwork**

- **3. Provide and utilize D2P sampling elements for planning/incorporation**

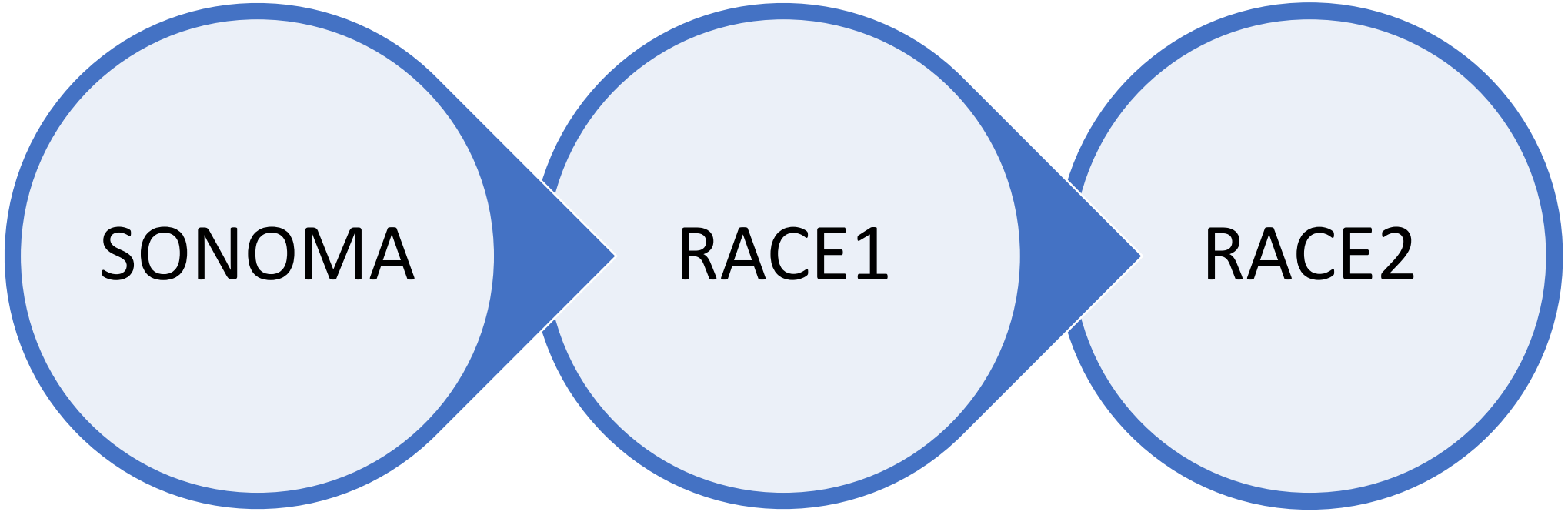
- **3. Manage / Innovate on D2P guided methodologies for TMS for performance to podium finish**

- **TMS: TIME MOTION SCALE**



Performance for a podium finish

Channel Building strategy for Analytics



JUDGING CRITERIA incorporated – DATA SET ANALYSIS PROJECT/APPLICATION, SOLUTION DESIGN, POTENTIAL AND TRIAD BASED IMPACT, QUALITY OF THE IDEA/GUIDED METHODOLGY PROMOTION FOR THE DATA REVIEWED OR ANALYSIS POSSIBLE AND SHOWCASING

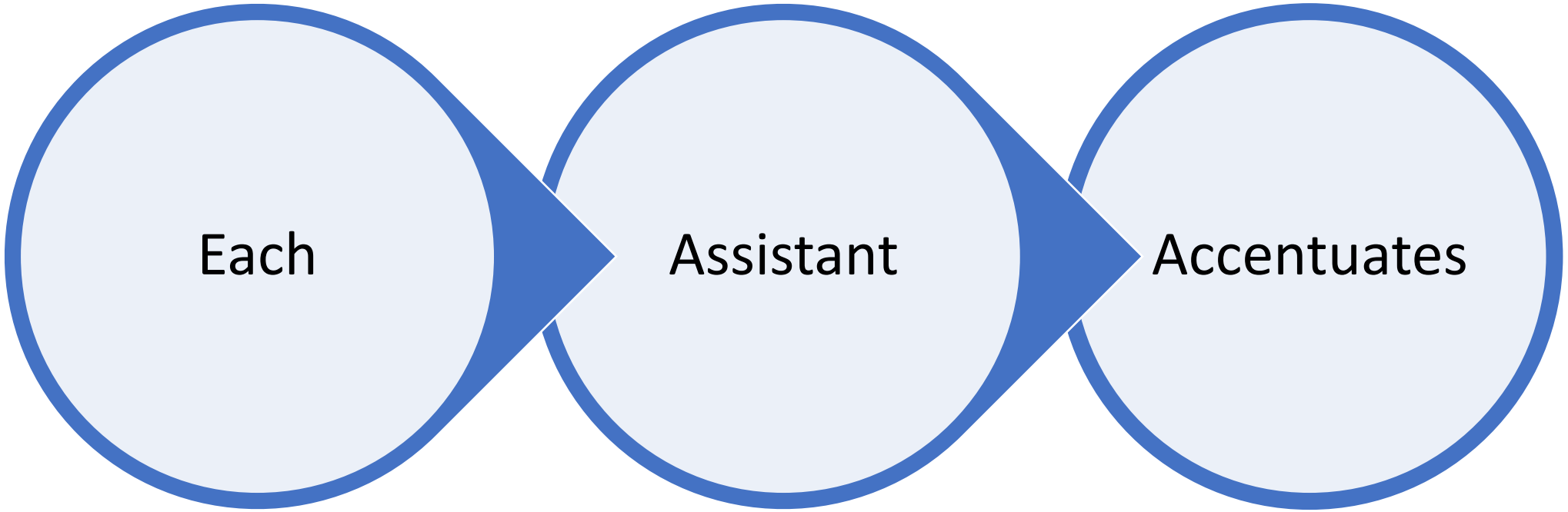
Performance for a podium finish

Baseline D2P guided methodologies

The following tabulation guides the driver and engineering team to perform for a podium finish, given the past and estimated changes to the DPD

Steps	Guided methodologies
D2P Management Index to D2P lifecycle	AOEC Data set Accentuating solutions
D2P Workflows and a Vehicle Condition, or Telemetry-or-Sensor-control Assistants	AOEC Data set Accentuating solutions
D2P Workflows and a TMS-Guiding-system Assistants	AOEC Data set Accentuating solutions
D2P Workflows and a Contingency-Plan Assistant	AOEC Data set Accentuating solutions
D2P Workflows and a Call-for-Mitigation-Plan Assistants	AOEC Data set Accentuating solutions
D2P Workflows and a D2P-Fencing System Assistant & Remote Management Assistant	AOEC Data set Accentuating solutions
The next few sections highlight the use of assistants to help performance for a podium finish	AOEC Data set Accentuating solutions

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



Guidelines for Structural Body Work

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

- W**hether painting has been done in stages? Mu**lti-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 plan 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**
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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.
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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.
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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.
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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 <u>Crash Safety Assessment</u>**
- **[ ] 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
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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

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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)

[ ] 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 sheck

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

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

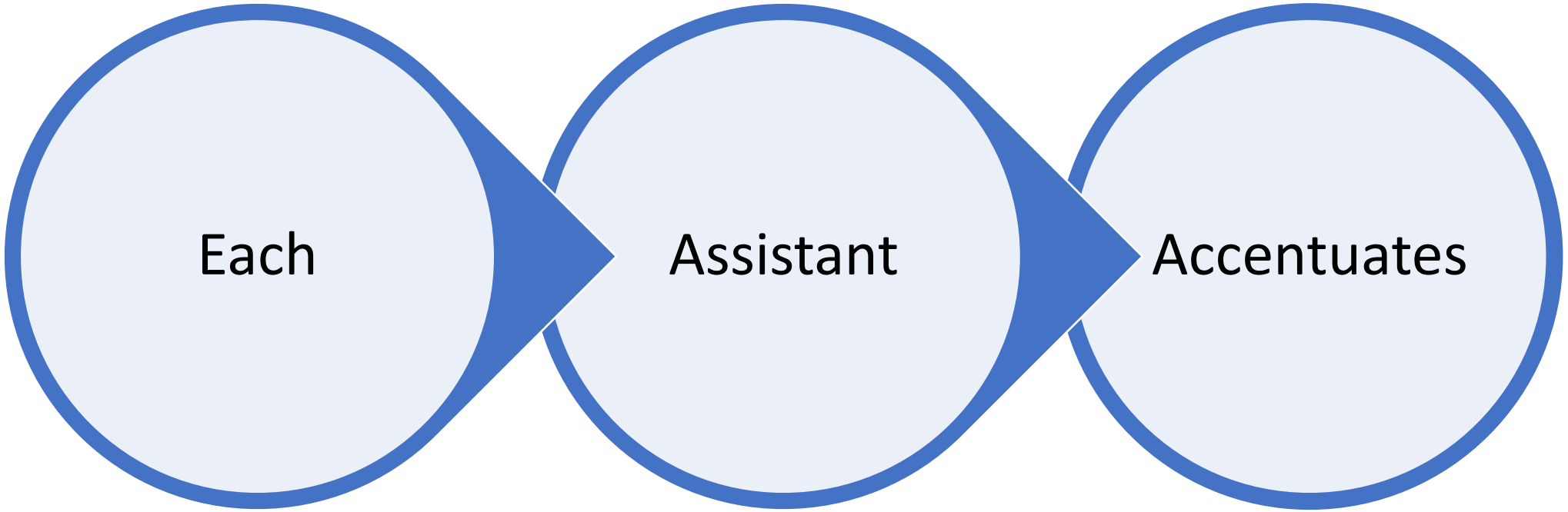
Guidelines for Trouble shooting

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

TMS-Guiding-system Assistants – Driver Fitness



Driver Fitness while at the wheel

Contents

1. Self-acknowledgement of driver fitness
2. Continual undertaking for driving
3. Continual awareness of mandatory race/rally hazards
4. Continual awareness of cautionary race/rally hazards
5. Continual awareness of warning race/rally hazards
6. Continual awareness of adherence to norms for fatigued/drowsy driving
7. Fitness report for a race/rally/track
8. Fitness ticket for a race/rally/track

DRIVER FITNESS NOTIFIER

The acknowledgement of driver fitness can be done via the race /rally organizing network.

What are the hazardous factors for the race/rally/track (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 race/rally/track (where the applicability differs)?

8. Poorly maintained septic systems

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

10. Rally/Race/Track Hotspots

11. Lack of self-assessments of driver fitness with rally/race/track 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 system/race factors.

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

DRIVER FITNESS NOTIFIER

Continual undertaking for driving (Tick as applicable)

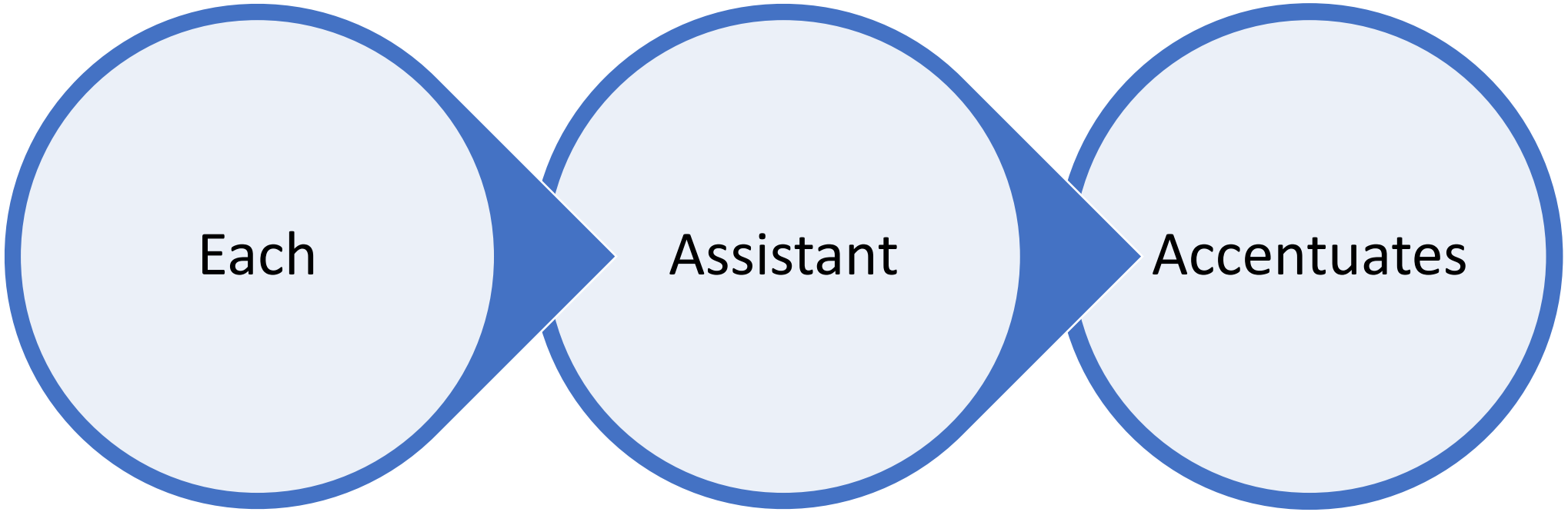
- ❑ I am not under the influence of alcohol & will not consume any while driving
- ❑ I am not under the influence of drugs & will not use any while driving
- ❑ I am as deemed physically fit to drive
- ❑ I am as deemed mentally fit to drive
- ❑ I will adhere to the rule of fastening seatbelts
- ❑ I will adhere to the rule of wearing protective headgear (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 race/rally)

DRIVER FITNESS NOTIFIER

Continual awareness of warning signs (Tick as applicable)

- ❑ Yawning
- ❑ Inability to keep eyes open
- ❑ Talking incoherently or inability to respond to questions from assisting team co-drivers
- ❑ "Nodding off" and trouble keeping your head up
- ❑ Inability to remember driving the last few laps
- ❑ Ending up too close to nearby cars
- ❑ Missing race/rally/track signs or guided turns
- ❑ Drifting into other lanes or onto rumble strips

TMS-Guiding-system Assistants



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D2P ACCENTUATOR ASSISTANT

Lap/PSW edition Identification and Configuration Details

- **Lap / Track Name:**
  Lap Id:
- **PSW Edition:**
  PSW Id:
- **Lap Edition:**

- **Drive experience highlight:**

- **Drive experience focus/capability:**

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D2P ACCENTUATOR ASSISTANT

- **Estimated drive time remaining (by track / by observation+):**
- **Estimated DPD needs (in terms of):**
- **Estimated type of driving / critical interactions:**

- **Current / Estimated condition or history:**

- **Flagging of DPD issues/emergency responses/special needs:** Yes/No

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- **Estimated Road surface / Race track type:**

- **Estimated Critical interaction details:**

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- **(CIZ) Estimated Critical Interaction Zone details**

- **Nature of performance / response expected:**

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- **Performance OK/Clearances from current PSW:**

- **Performance Overheads/Failures by current PSW:**

- Performance with **next possible repair/replacement/ maintenance** by current PSW.

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- **PSW Edition Sampling, Inspection or Maintenance schedule (tabulation):**
- **Log date/time:** **Log Id:**
- **Carried out by:**
- **Details of work carried out (as relevant to the case)**
- **(a-1) Visual and Flagged inspection**
- **Details:**

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- **PSW Inspection or Maintenance schedule (tabulation):**
- (a-2) Vehicle Parts / Systems Assessment (as per CIZ and related conditions)
- Details:

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- **(a-3) Pit stop Window and Closer inspection by race engineering/ race expert (as applicable)**
- **[Details:**

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- **(b) D2P Preventive maintenance details (as applicable)**

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- **(c) D2P Corrective maintenance details (as applicable)**

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- **(d-1) D2P Front end 5R(s) / Driver experience 5R(s)**

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- **(d-2) D2P Back end 5R(s) / Race engineering 5R(s)?**

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- **(d-4) PSW / Incidence management back to the track details (as applicable)**
- **Details:**

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- **(e) Lead/Lag, Drive experience or performance issue-mitigation details (as applicable)**
- **Details:**

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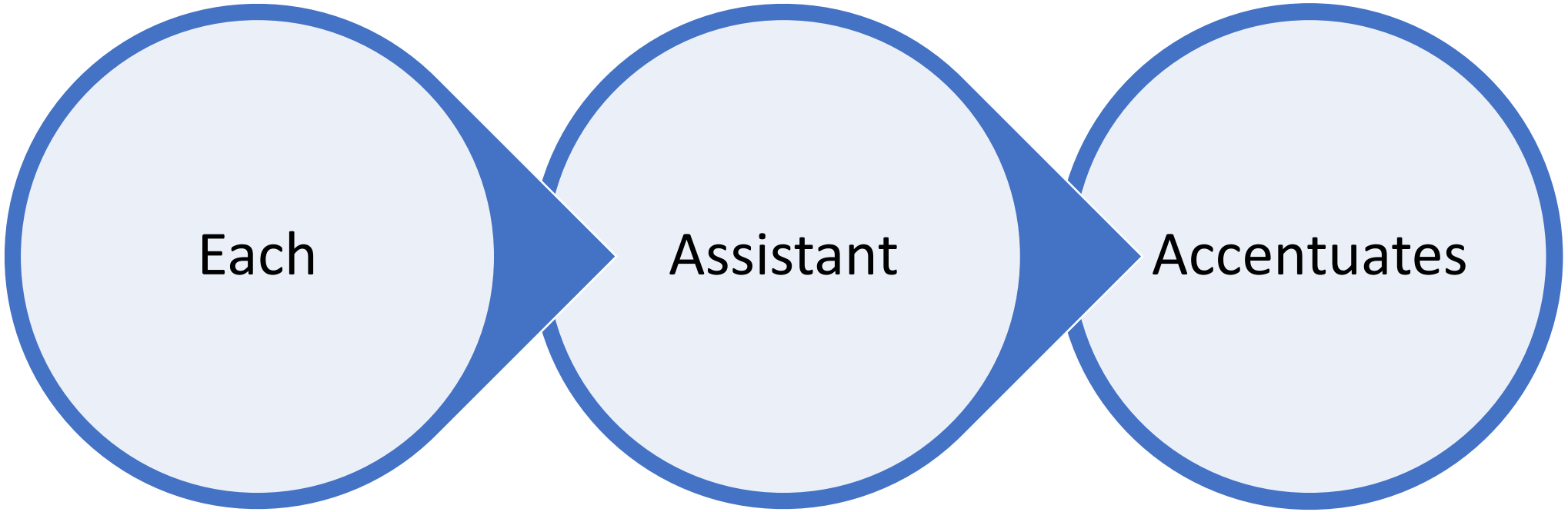
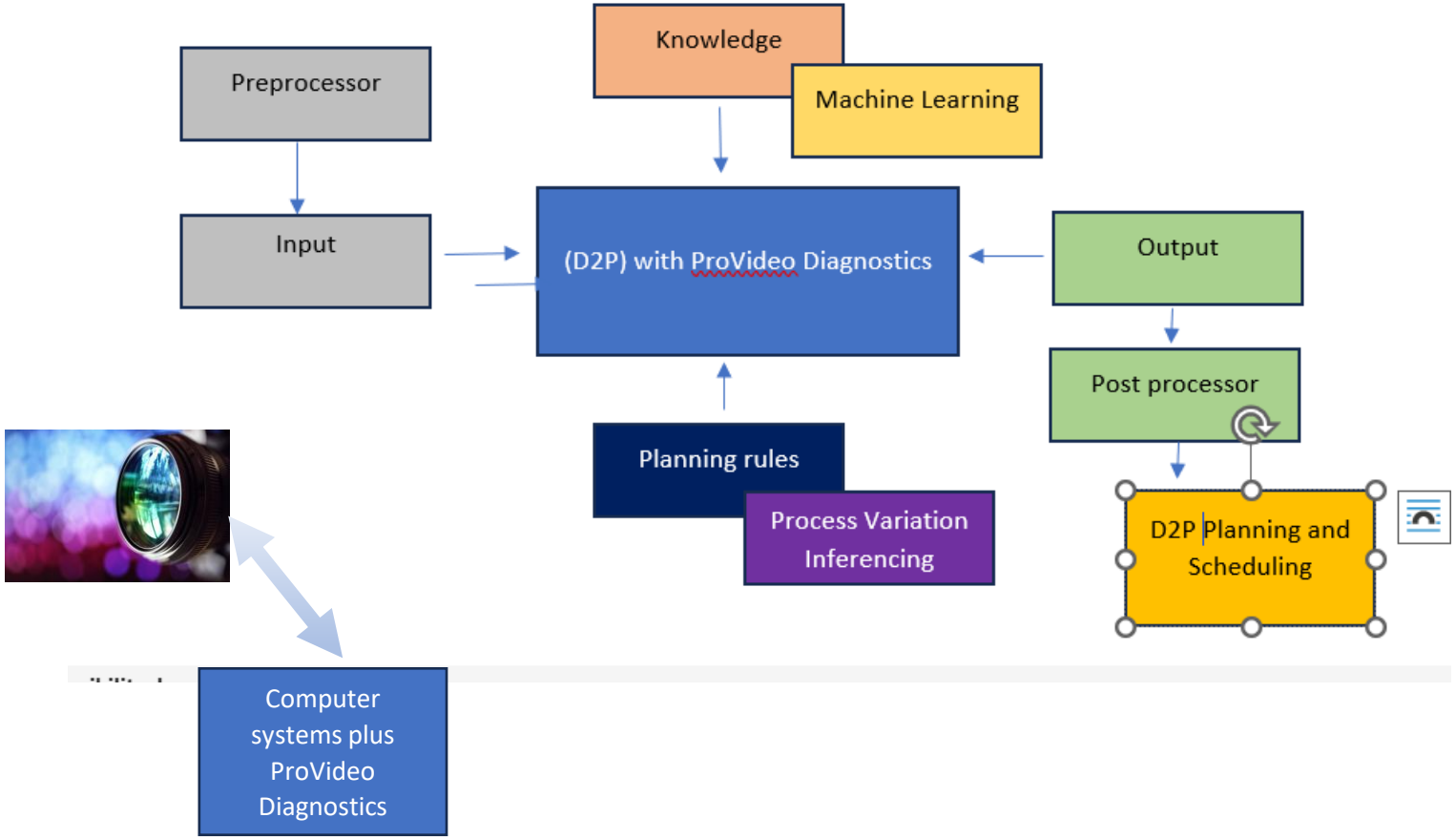
- **(f) Safety advisory (as relevant to the case):**
- **(a) Dos**
- **(b) Donts**

TMS-Guiding-system D2PVideo Assistants



TMS-Guiding-system D2P VIDEO ASSISTANT

- Use Python and Machine Learning to perform D2P video comparison for diagnostics and troubleshooting (D&T)
- The D&T scope is exploratory and will crystallize with the implementation



Performance for a podium finish

- AOEC finds that instrumentally, the Data to Performance (D2P) Lifecycle must define a
- workflow for accentuating
- 1. The Rally/Race track Landscape
- 2. Pre-event forecasts of the KEY PERFORMANCE INDICATORS
- 3. Pit stop Work SMART(ness) as per the rally or race track
- 4. Driver and Co-driver team SMART(ness)
- 5. 5R(s) SMART(ness) for a podium finisl

CRITICAL INTERACTION DETERMINERS

ROAD SURAFCE COVERINGS, LIGHT / SHADE ISSUES, CURVES, MEANDERS, INCLINES, BOTTLENECKS, CLOSE PROXIMITY REGIONS

SMART(ness) :

SPECIFIC CRITICAL INTERACTION FOR MEETING NEED WITH APPLICABLE INSIGHT RESPONSE AND TEMPERAMENT

Computer systems plus ProVideo Diagnostics

Data sets

EXPERT SYSTEM

SPHERE OF CONTROL, FOCUS, CAPABILITY AND INGENUITY

TIME MOTION SCA;LE / POINT SLOPE INTERCEPTION

Sampling elements

Performance for a podium finish

CRITICAL INTERACTIONS

EXPECTED COMPETITIVENESS, PROBABLE INCIDENCE/HAZARD/ RISK/RULE COMPLIANCE, PRECISE DRIVING, ENDURANCE DRIVING, INTERCEPTING CURVES, MANEUVERING OPTIONS, RESPONSE, RAPID RESPONSE, FLAGGING FOR PIT STOP WINDOWS, EMERGENCY RESPONSE / SPECIFIC NEEDS

TMS-Guiding-system - D2P VIDEO ASSISTANT

- The proposed solution will be based on 3 fundamental stages, that is
- 1. Process
- 2. Diagnose
- 3. Classify
- **The Process stage of the solution**
- **1. Process (being sampled)**
- The Process stage will enable a PODIUM D2P master and REALTIME D2P candidate video to be played in 2 different panes to check quality or eligibility, or played and captured as (snapshot) frames, where the frames are stored in specific master and candidate folders for these frames to be later reviewed, diagnosed and classified
- The code for comparing images of a candidate video image with a PODIUM master video image has been tested using the sift implementation available in cv2

TMS-Guiding-system - D2P VIDEO ASSISTANT

The Diagnose stage of the solution

2. Diagnose (to be sampled)

The Diagnose stage will use a PODIUM D2P master folder and REALTIME D2P candidate folder of master and candidate video (snapshot) frames.

On the selecting of a master video frame, it will be used for training, diagnosis and associated comparisons.

If a candidate video frame does not comply with the conformity of the benchmarked master video frame, then the candidate frame will be copied into the C-Frames-not-ok sub folder for further deep learning/classification

If a candidate video frame does comply with the conformity of a benchmarked master video frame, then the candidate frame will be copied into the C-Frames-ok sub folder under K-Nearest Neighbour distance pretexts

- **The Classify stage of the solution**
- **3. Classify (to be sampled)**
- The candidate video and candidate video frames that are not conformant in comparison with the benchmark master video and master video frames, will be specifically used for deep learning of the issues seen or for classification that permits in-sync problem resolution.
- The feature of deep learning will evolve with the scope of the project/solution

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ProVideo Diagnostics , Inferencing and Learning based classification (highlight)

Classification based on D2P drive expectation/in-vehicle computer vision (basic or integrated)
Classification based on D2P Flow Analysis
Based on D2P Rally/Race/Track Index classification and D2P Panel coding scheme
Based on a Discrete Events System

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Rally/Race/Track Index **classification and D2P panel coding scheme (highlight)**

D2P Driver attributes
D2P Co-driver attributes
D2P drive expectation attributes
D2P panel coding scheme basis
D2P Vehicle-CLASS system
D2P (DPD-CLASS) system
Vehicle Spec Sheet based Code system

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Discrete Events System (highlight)

D2P drive experience Planning
Driver and Co-Driver D2P Vehicle Spec Sheet Resource Allocation
D2P Group scheduling and integrated handling
Drive experience and sequencing
Setup time
Vehicle Running time
Drive performance evaluation time
Lap Time
DPD management level
D2P Flow efficiency

TMS-Guiding-system - D2P VIDEO ASSISTANT

D2P drive experience Planning (highlight)

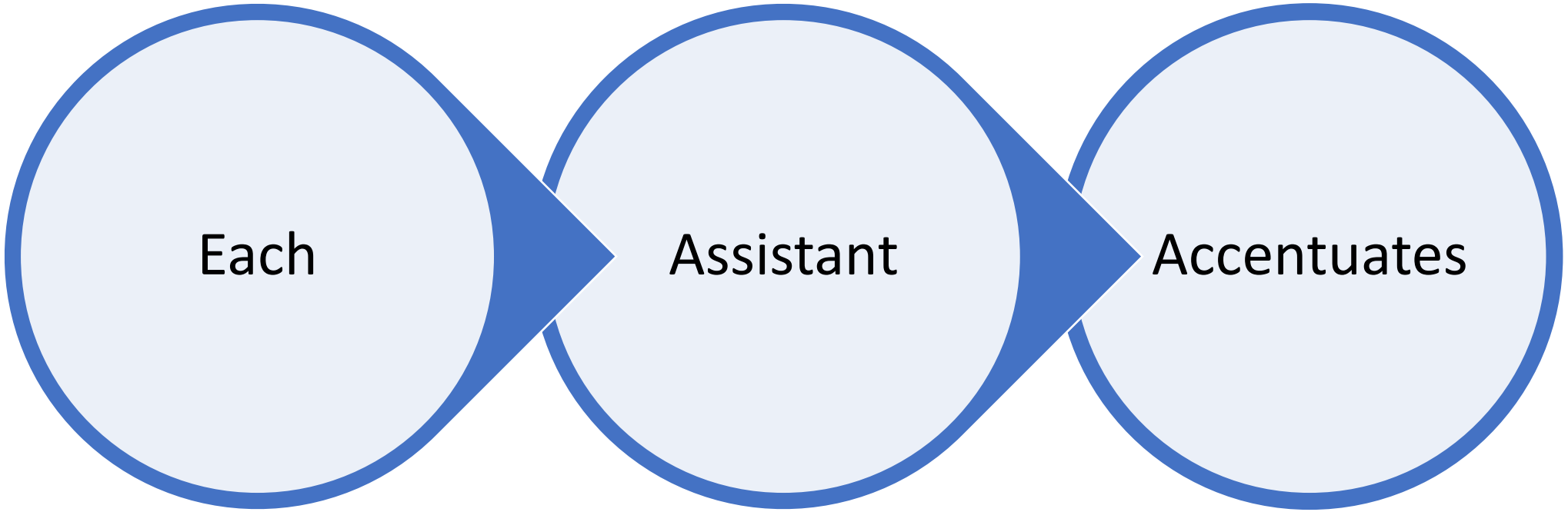
Capability of understanding and analysis of DPD characteristics
Knowledge about *Vehicle-CLASS*, *DPD-CLASS* and D2P Vehicle Spec Sheet Resource characteristics
Capability of understanding of inter-dependencies between *DPD characteristics-D2P process-D2P Quality-Lap TMS efficiency*
Multiple calculation and measurement abilities
Relevant D2P Vehicle Spec Sheet Resource Allocation of *Men, Machines, Materials, Measurement and control systems, Machine learning systems*
Legibility of D2P flow involvement
Ability to incorporate other DPD needs/functions/applications/Track index programmes

TMS-Guiding-system - D2P VIDEO ASSISTANT

D2P Efficiency based comparison, inferencing and learning factors (highlight)

D2P (Drive to perform) Setup
DRIVE PERFORMANCE DIMENSIONING (DPD) FACTORS
D2P Teamwork
D2P real-time Flexibility
Efficient D2P driving time for laps of importance
Pit stop window time for laps of importance
D2P lead/lag costs for laps of importance
D2P Race/Rally/Track LAPS DPD-Efficiency
D2P Race/Rally/Track Finish DPD Efficiency
D2P Race/Rally/Track LAPS DPD Lead/Lag Queuing
D2P Race/Rally/Track LAPS DPD Automation Efficiency
D2P Race/Rally/Track LAPS DPD Future expectation
D2P Race/Rally/Track LAPS DPD-Quality
D2P Race/Rally/Track LAPS DPD-Inspection
D2P Race/Rally/Track LAPS DPD-Panelling and Codification
D2P Race/Rally/Track LAPS DPD-REPI utilization
D2P Flow control
D2P Race/Rally/Track Lead/Lag time management
D2P DPD-Engineering changes
D2P DPD-Open-environment changes

Contingency Plan Assistant



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 or on-the-track, 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

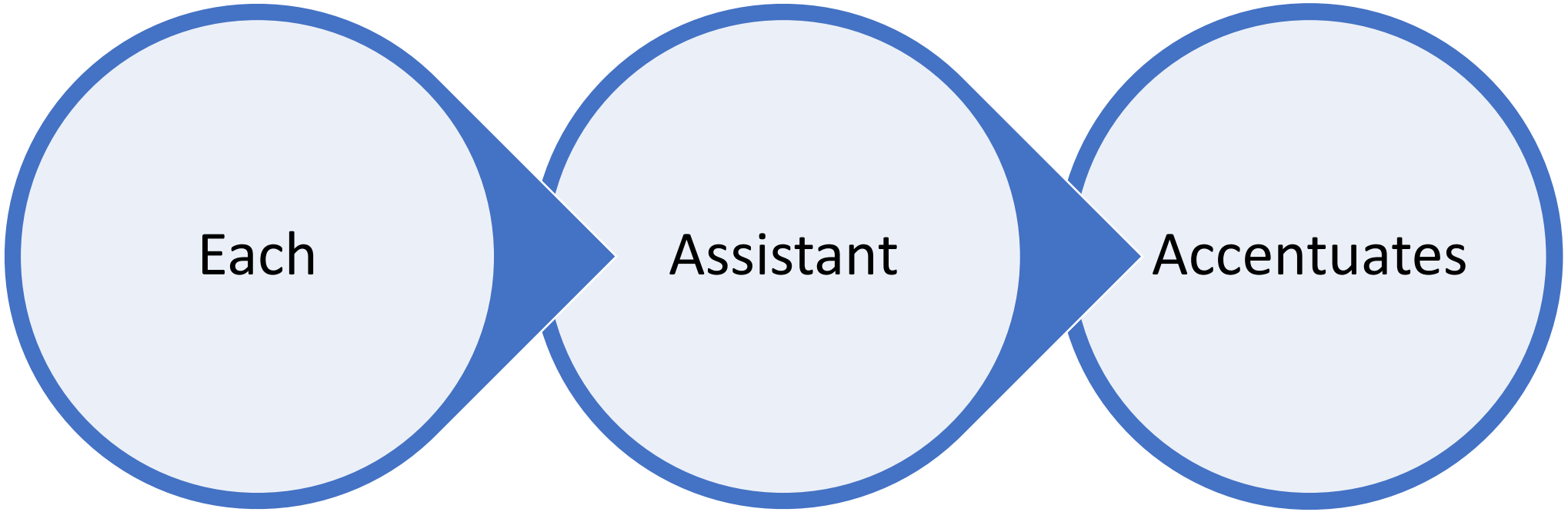
Contingency Plan Assistant

When on-road or on-the-track, 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

Call-for-Mitigation Assistants



Call-for-Mitigation
D2P ACCENTUATOR ASSISTANT

- **Emergency / Specific Needs/ Failure / Hazards Assessment Report (as a baseline)**
- 1. Has any unclear drive experience flagging been done?
- 2. Are there history of interaction based performance issues?
- 3. Are there any newer performance issues?
- 4. Are there any failure or emerging failure issues?

Call-for-Mitigation
D2P ACCENTUATOR ASSISTANT

- 5. Are there detached parts or hanging parts?
- 6. Has the body work been affected?
- 7. Are there engine problems?
- 8. Are there attached systems/parts problems?
- 9. Have any parts/components fallen of?
- 10. Have adjacent drivers reported any sightings or issues?

Call-for-Mitigation
D2P ACCENTUATOR ASSISTANT

- 11. Have any parts degraded or developed pre-mature failure patterns?
- 12. Have any wires/connections/cables been affected or have any connections separated?
- 13. Has the location of sensors changed/shifted due to drive experience/issues?

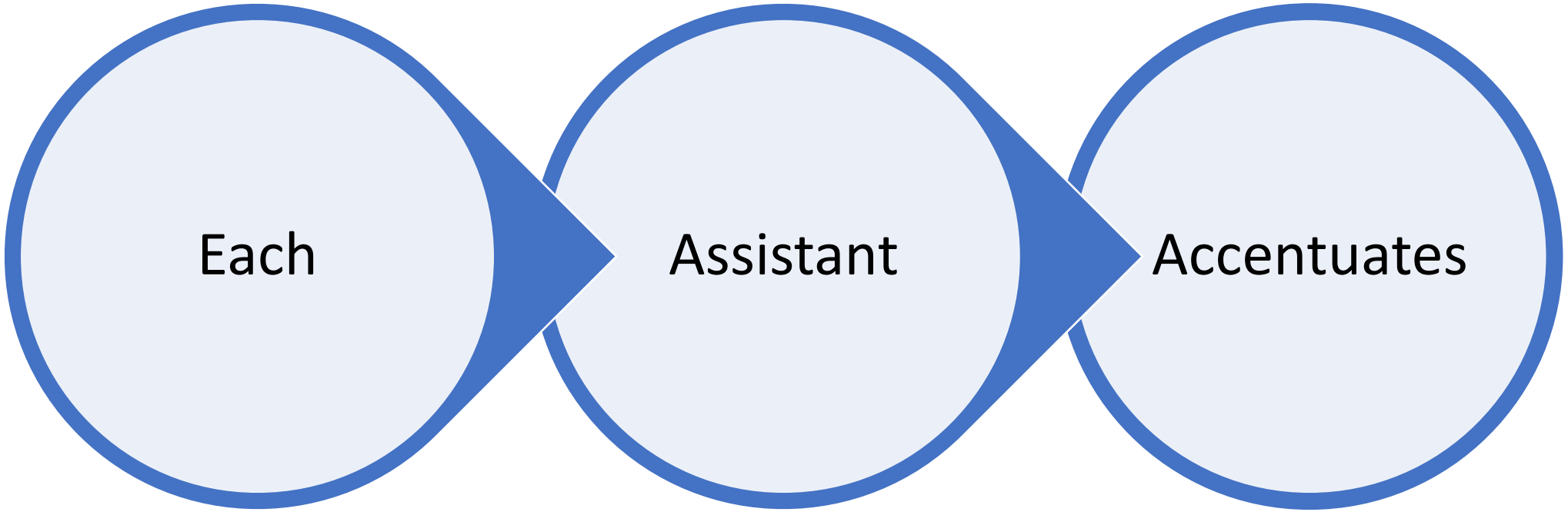
Call-for-Mitigation
D2P ACCENTUATOR ASSISTANT

- 14. After the last pit stop work (PSW), are there any new issues/problems/changes in driving

- If the answer is yes to any of the relevant questions, then the D2P team may need to rethink strategy/estimations/actions.

- We are work in progress for the Dev Post submission, but expect to complete by the deadline of Nov 25,2025

D2P-Fencing System Assistant & Remote Management Assistant



Safer Driving while rallying or racing

Contents

1. Acknowledging road system/track KPI(s)
2. Designing road system/track KPI(s)
3. Nature of planning
4. Nature of congestion
5. Stabilizing aspects
6. Probable Hazards
7. Associated Planning
8. Traffic Management Advisory
9. Fuel Consumption (Causative)
10. Associated Traffic Management

SAFER DRIVING

Acknowledging the need for road system/track KPI(s)

Designing Key Performance Indicators (KPIs) for connected road systems/tracks to help a race engineering/organizing network improve the imperative of safer driving, can be done SMARTLY via a notifier.

This input does consider that organizers have taken multiple steps to aid in good route and layout planning with expected drive to perform guide-lining and condition improvement, restoration or maintenance like the use of modern engineering tools such as GIS, which have been used to digitize road/track inventory and road/track history of all Arterial, Sub-arterial, Main or Side roads or event based routes.

The given template helps improve driver safety & risk mitigation by associating certain key indicators for a road/track, a stretch, a route, a ring road system or a lap designed system.

It is expected that a specialized "**REPI Safety panel**" can collect (either via the race engineering teams/ driver and co-driver teams directly or via the race engineering / organizing networks & its delegated representatives) different details about those roads, stretches, routes, ring road systems or lap designed systems that are part of a rally/race/track.

These details can be used by the Concerned Civic Bodies, Rally/Race/Track Traffic Guides, Risk / Hazards Level/REPI Controllers and Emergency Response & Disaster Mitigation Guides for **intervention, incidence mitigation and resolution.**

SAFER DRIVING

- 

RoadMIR and RoadKPI framework

SAFER DRIVING

DESIGNING ROAD/TRACK KPI(s)

Road system/Track name: **Road system/Track Id:**

REPI Safety Account id:

Date of submission: **Time of submission:**

Mapping from: **Mapped till:**

Mapping pending:

Type of road system/track: Road/Stretch/Route/Ring road/Lap designed track

Type of transportation that uses road system/track: Public transport/Private transport/Pooled transport/Personal transport/Priority transport/dedicated for rallying or racing transport

SAFER DRIVING

Added commuting systems: Overhead Metro/Underground Subway/Tram

Current Risk / Health: Acceptable/Other reports/Do not know

Health details: …

Associated images (to be shared in.jpeg format with details on location):

Key Performance indicators (KPI(s))

Key Performance indicators can help a Race engineering team, Driver and Co-driver team, Race organizing network, REPI Safety panel and different management entities record and use information to manage issues and help reduce problems associated with races/rallies/tracks.

SAFER DRIVING

Nature of planning (Rated as a crucial influencer):

( ) **Design standards compliance** (width of road/track, margins for pillars, gradient designs, curves designs, median designs, arboriculture safety, vehicle and driver safety, safe commuting between 2 points/pit stop windows, reasonable time taken to travel from one point to another, enablers for vehicles that use renewable energy)

( ) **Accountability for Traffic factors** (speed standards set for road systems/tracks, reaction time based on PIEV*, navigation standards, safe stopping sight distance, safe overtaking or passing, safe sight distance for entry into any associated intersections, feedback systems)

( ) **Accountability for Environment factors** (sentinel screening and risk mitigation for unforeseen snow fall, hailstorms, heavy rainfall, thunder storm and lightning arrestors, ease of maintenance despite severe weather conditions)

( ) **Maintenance Systems reliability** (proper design out maintenance, risk mitigation & maintenance, inspection and maintenance of extensions, gradient-design validation, policy for emergency services, policy for disaster management services)

( ) **Quality of associated Drainage systems** (design and implementation after consideration of water table, sub-grade soil, reinforced earth, nature of geo-grids that are to be used in the road/track construction, management of seepage flow & capillary rise, reliable impervious wearing surface of road/track with aggregators and binders)

SAFER DRIVING

Nature of planning (Rated as a crucial influencer):

( ) **Quality of race signalling systems** (“(Google Earth related) satellite imagery, or drone flight imagery or sentinel sensor feedback based” Risk Mitigation Desk notifications and proactive responses by the rally/race/track event management network, by nature of design “intelligent signaling solutions” that decide as to how event traffic/vehicles have to be managed or routed in case there is a disaster, accident, or in a case where part of the road or road system or track is rendered unusable)

( ) **Satisfactory Emergency Response planning** (Equipped with signage and barricade deployment, contact numbers for nearest “ambulance services, hospital, police station, fire department, disaster management department”, availability of first aid provisions, equipped with fire extinguishers & fire fighting facilities, equipped with smoke alarm systems, equipped with sentinel sensors, has (futuristic infrastructure) clearance for air lift to save life)

PIEV* stands for –Driver / Co-driver-Assisted Perception time, Intellection time, Emotion time, Volition (Final action) time

SAFER DRIVING

Nature of congestion (Rated as important negative influences):

( ) Perennial road/route/track layout limitation

( ) Seasonal road/route/track layout congestion

( ) Time-based road/route/track layout congestion

( ) Incidence specific road/route/track layout congestion

( ) Rally/Race Event Assisting Traffic specific congestion

( ) Response to incidence / incidental movement specific congestion

( ) Congestion due to other influences

SAFER DRIVING

Stabilizing aspects (Rated as positive influences):

( ) Has a REPI Safety Specification

( ) Has satellite images

( ) Included in Google maps

( ) Is of good quality

( ) Has multiple-lanes / pull over to the side layouts

( ) Has sensor-enabled medians or bordering barricades

( ) Has reliable rally/race/track assisting signals

( ) Has (futuristic infrastructure) Climate Change sensors

( ) Accountable rally/race/track intervention possible at location

( ) Not in close proximity to industries

( ) Not in close proximity to rivers and other rainfall affected water bodies,

SAFER DRIVING

Stabilizing aspects (Rated as positive influences):

( ) Has storm water drains

( ) Has well maintained septic systems

( ) Not affected by festivities

( ) No layout sidewalks

( ) No encroachment

( ) No alteration

( ) Not sidelined by trees

( ) No afflicted by dumping of industrial waste

( ) Not afflicted by dumping of public waste

( ) Has a proper sewage system

SAFER DRIVING

Probable Hazards (Rated as very important negative influences):

( ) Is an inter-link for other roads or routes or laps etc

( ) Is in close proximity to neighboring states

( ) Is in probable or escalated tension areas

( ) Is a sensitive area (where satellite imagery a threat)

( ) Is in close proximity to an industrial cluster

( ) With curving meanders

( ) Has a steep incline with improper entry or exit

( ) Has underlying dangerous landforms

( ) Is in close proximity to dangerous landforms

( ) Has a history of unattended degraded areas

( ) Has degraded areas

( ) Is sidelined by less maintained trees

SAFER DRIVING

Probable Hazards (Rated as very important negative influences):

( ) Is in close proximity to rivers and other rainfall affected water bodies

( ) Is in close proximity to marshes or swamps

( ) Is part of a bridge or connects to a bridge

( ) No storm water drains

( ) Has poorly maintained septic systems

( ) Afflicted by incidences of bottlenecks

( ) Is difficult to manage via surveillance

( ) **Is prone to sudden risk/hazard/rush** (due to lack of surveillance/being a remote location/ lack of rally/race/track signals/lack of lighting)

( ) **Is prone to accidents** (due to lack of sufficient planning for vehicle and driver/assisting team safety)

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SAFER DRIVING

Associated planning, risk mitigation, condition management, repair and/or restoration programmes

The addressing of problems is either well-planned or not well-planned, where the following indicators can help identify issue levels for the commuter:

Planned (Rated as positive influences)

( ) Forecast based

( ) REPI Desk / Control Room based

( ) In time surveillance based

Not well-planned (Rated as very important negative influence)

( ) Only reciprocal (where problems are addressed in a reactive manner)

( ) Only when problems are escalated

( ) Only when more grievances are reported

SAFER DRIVING

Associated planning, risk mitigation, condition management, repair and/or restoration programmes

Signage deployed to mitigate risks to drivers or assisting teams

( ) **Road/Track regulations or signs identifying safety norms** (one-way or two-way routes, permitted timings, speed limits, rules for vehicle and assisting team safety, rules about overtaking, rules against cutting lanes, rules for pulling over, signage about low visibility zone, low height clearance and vehicle gross weight / 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 or REPI panel)

( ) **Signage and barricades for bends/curves/meanders/and septic systems**

( ) **Signage with precautionary and must know information about ring road, flyover, bridge, tunnel, subway, metro track, tram track, and level crossing**

SAFER DRIVING

Traffic management advisory for a road system/track (Rated as positive influences)

( ) Stay off this road/stretch/route/ring road/track at particular times

Details on timings:

( ) Stay off this road/stretch/route/ring road/track on particular days

Details on days:

SAFER DRIVING

Traffic management advisory for a road system (Rated as positive influences)

( ) Recommend moderate utilization whenever possible

( ) Restricted for goods carriers

( ) Restricted for heavy motor vehicles

( ) Restricted for 3-wheelers

( ) Restricted for 2-wheelers

( ) Restricted for pollution accelerators

( ) Connects or connected to bad roads or problem afflicted routes

( ) Not to be used by vehicles solely using renewable energy or batteries

SAFER DRIVING

Traffic management advisory for a road system/track (Rated as positive influences)

[Due to Environment factors]

( ) Not to be used by Emergency Response vehicles

( ) Not to be used by Special Needs vehicles

( ) **Not to be used by assisting teams without personal safety arrangements**

SAFER DRIVING

FUEL CONSUMPTION (CAUSATIVE INFLUENCES)

Recommended types of vehicles that can use this road system/track:

( ) Petrol vehicles

( ) Diesel vehicles

( ) LPG vehicles

( ) Renewable energy or battery powered vehicles

( ) Race engineered vehicles

Details about how much fuel may be consumed: Unpredictable-fuel-consumption/High-fuel-consumption/ Medium-fuel-consumption/Low-fuel-consumption/ Fuel-consumption-not-a-priority

SAFER DRIVING

ASSOCIATED TRAFFIC MANAGEMENT (RATED AS POSITIVE INFLUENCES)

LiveUpdates possible from Google maps: Yes/No/Not applicable

Notifications possible about trends in route: Yes/No/Not applicable

Notifications possible for GPS based Emergency Response network: Yes/No/Not applicable

Intervention possible by route forecasting: Yes/No/Not applicable

Details:

Vehicles can avail of renewable energy or battery charging services in this route: Yes/No/Not applicable

Driving teams can avail of drive guidance services in this route: Yes/No/Not applicable

Driving teams can avail of emergency breakdown services in this route: Yes/No/Not applicable

Driving teams can avail of surveillance based security and/or REPI assistance in this route: Yes/No/Not applicable

SAFER DRIVING

ACCIDENT RELIEF, EMERGENCY RESPONSE AND ASSISTANCE VIA THE REPI SAFETY PROJECT (RATED AS POSITIVE INFLUENCES)

[ ] Equipped with first aid provisions

[ ] Has clearance for (futuristic infrastructure) air lift

[ ] Equipped with fire extinguishers and fire fighting systems

[ ] Equipped with smoke alarm systems

[ ] Equipped with health / life saving assistance for the driving team

Details: These sensors need to measure and report the ambient temperature, quality of air, possible visibility levels, relative wind velocity & humidity levels, and relative gross vehicle weight or loading (where load levels are important for flyovers, bridges and ramps)

SAFER DRIVING

ACCIDENT RELIEF, EMERGENCY RESPONSE AND ASSISTANCE VIA THE REPI SAFETY PROJECT (RATED AS POSITIVE INFLUENCES)

[ ] Equipped with (specific) surveillance sensors or Intelligent safety systems that ensure REPI Desk/control room assistance (related to drivers and relevant assistance teams)

Details: The sensors being integrated into (futuristic infrastructure) sentinels can include collision detection sensors and systems for intelligent security solutions, where visibility levels are improved, sound sensors are installed to relay any signs of screaming or scuffles, rally/race signal violations are monitored, fast track monitoring of the sudden appearances of vehicles at unpredicted times of the event

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SAFER DRIVING

Fitness report for a road system/track (part of the Codified Location Planner/ Advocacy)

Road system/Track name: **Road system/Track Id:**

REPI Safety Account Id:

Date of 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

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SAFER DRIVING

Fitness report for a road system/track

( ) 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

SAFER DRIVING

Fitness report for a road system/track

( ) Driver / Assisting team 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

SAFER DRIVING

Fitness report for a road system/track

( ) Availability of alternate rally/race/track assisting services

Details:

For example "**Overhead Metro/Underground Subway/Tram"** with added details

( ) 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

SAFER DRIVING

Fitness report for a road system

( ) Availability of alpha assistance services for impaired drivers or co-drivers or assistant teams

Details:

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

- Self-developed ability/reasoning/competency
- Continual ownership to be objective, accountable, and self-managed to mitigate **common-for-affliction** impact and setback with or without Physically Assistive Infrastructure, Physically Assistive Technology/Systems/ Equipment/Products/Processes or Digitally Assistive Infrastructure Technology/Systems/ Equipment/ Products/Processes

( ) 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

SAFER DRIVING

Fitness report for a road system/track

( ) Vital network and signal coverage

Details:

For example "**Normal network connectivity/Failing network connectivity/ Problematic network 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

SAFER DRIVING

Fitness ticket for a road system/track (part of the Codified Location Planner/ Advocacy)

A Commuter Safety Desk can register tickets that acknowledge receipt of notifications from commuters & people and also notify the higher level management entities of various problems related to a particular road, stretch, route or ring road system.

IMPORTANT DETAILS

Ticket Id: Source:

Ticket status: Open/Closed/Escalated/Needs details/Not available

Date of submission: **Time of submission:**

Road system/track name: **Road system/track Id:**

Commuter Safety Account Id:

SAFER DRIVING

Fitness ticket for a road system/track

Problems faced for reasons such as:

( ) Quality levels

( ) Traffic volume levels

( ) Pollution levels

( ) Accidents or incidence (even crimes) trends

( ) Possible route diversions

( ) Impacted driver/assisting team comfort levels (specific to the D2P profile)

( ) Non-availability of alternate assisting services

( ) Non-availability of emergency response services

( ) Non-availability of drive guidance services

( ) Afflicted due to weather forecasts

( ) Faulty vital network and signal coverage

( ) Vehicle indicators (problems related to driving team / assisting team Health and Lifespan Dynamics)

SAFER DRIVING

Fitness ticket for a road system/track

Management of (negative influence specific)

Key indicators

[ ] Nature of layout congestion

[ ] Probable Hazards

[ ] Lack of Signage deployment

( ) Condition management, Repair or restoration

[ ] Interpretations on Fuel consumption

[ ] Lack of support for renewable energy or battery powered vehicles

SAFER DRIVING

Fitness ticket for a road system/track

Sustainable infrastructure (positive influence specific)

Key indicators

[ ] Stabilizing aspects

[ ] Planning behind condition management, repair or restoration

[ ] Signage and barricade deployment

[ ] Rally/Race/Track management advisory

[ ] Driving team/ Assisting team safety

[ ] Associated Traffic Management

[ ] Accident relief, Emergency response and assistance

[ ] Alpha assistance for any impaired driving team/assisting team members

SAFER DRIVING

Fitness ticket for a road system/track

Sustainable infrastructure (positive influence specific) :

Key indicators

Details of problems faced:

SAFER DRIVING

Fitness ticket for a road system/track

Sustainable infrastructure (positive influence specific) :

Key indicators

Resolution sought: