



# DEVELOPING ROAD SAFETY SCREENING AND APPRAISAL TOOL FOR WORLD BANK PROJECTS

Transport Global Practice

Smart Connections for All

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# Motivation for developing a new tool

- What the Bank stands for in Road Safety?
- Integrating economic cost-benefit analysis
- Project-level safety efficiency analysis
- Model relevant to LMIC environment (rural, inter-urban, urban)
- Burden on data collection, time, expertise and cost of evaluation

# Purpose of the Tool

**Lack of an appropriate Road Safety Efficiency Tool to use during WB project appraisal**

**Ex-ante outcome assessment (with & without project) with traffic growth and operating speeds**

**Support meeting the new ESF requirements**

**Diagnostic to evaluate project design early on**

**Meet WBG threshold for safety performance**

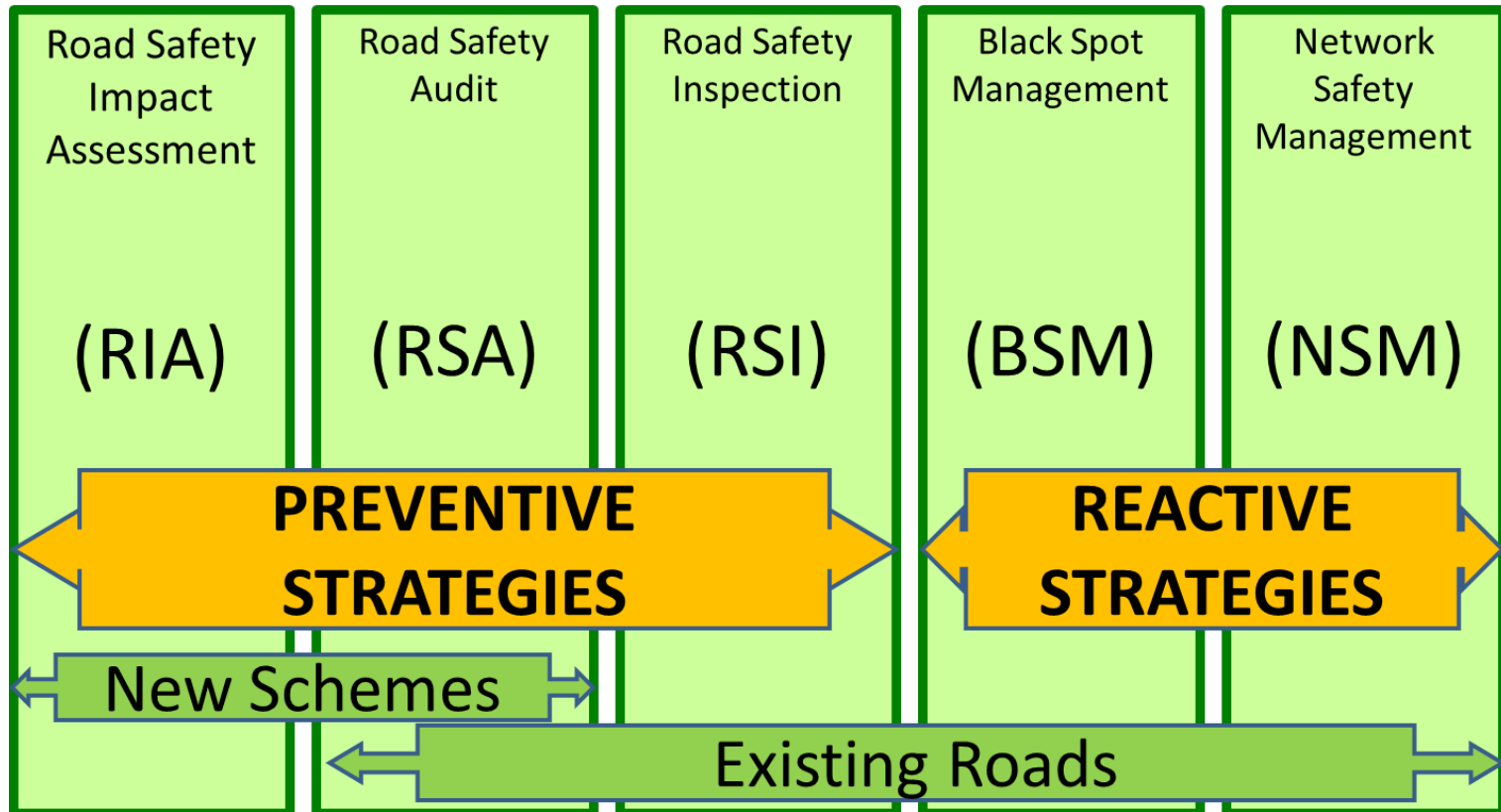
**Fits the broader set of assessment tools for evaluating multi-sectoral risk factors**

# Where does the Tool fit in project cycle?

Road Infrastructure Safety Management stage	Procedure/Tool
Planning and Design	<ul style="list-style-type: none"><li>• Road Safety Impact Assessment</li><li>• Efficiency Assessment Tools</li><li>• Road Safety Audit</li></ul>
Construction and Pre-Opening	<ul style="list-style-type: none"><li>• Road Safety Audit</li></ul>
Normal Operation	<ul style="list-style-type: none"><li>• Road Network Operation</li><li>• Safety Performance Indicators</li><li>• Network Safety Ranking</li></ul>
Maintenance and Renewal	<ul style="list-style-type: none"><li>• Road Network Operation</li><li>• Road Safety Inspection</li><li>• Road Assessment Program</li></ul>
Error Correction and Hazard Elimination	<ul style="list-style-type: none"><li>• High Risk Sites</li><li>• Road Safety Inspection</li><li>• Road Assessment Program</li><li>• In-depth investigation</li></ul>
Major upgrading and renewal	<ul style="list-style-type: none"><li>• Road Safety Impact Assessment</li><li>• Efficiency Assessment Tools</li></ul>

Source: adapted from Persia et al., 2016

# Package of Infrastructure Safety Management Tools



# Steps in using the new WB screening process (RSSAT)

Identifying homogenous sections on project roads (segment + intersection)

Enter baseline crash data (fatalities/serious injuries) by road-user types

Enter physical characteristics of the homogenous section (cross-sectional profile)

Enter operating speed and traffic flow information (AADT)

Enter traffic flow information about non-motorized users

**RSSAT is pre-filled with research-based CMF values and factors for speed and traffic flow risk factors (each road type & road user)**

# Outputs from the Tool

Change in fatalities (project design vs. baseline condition) – each road user group

Absolute road safety metrics – fatalities/km, fatalities/veh-km driven

Cost benefit (20 year period) – adjusted for AADT growth

# Overview of the Tool

## Inputs



Processing

Excel-based Tool: User Input-Output with locked model parameters

Project Safety Impact (PSI)

Costs  
Benefits

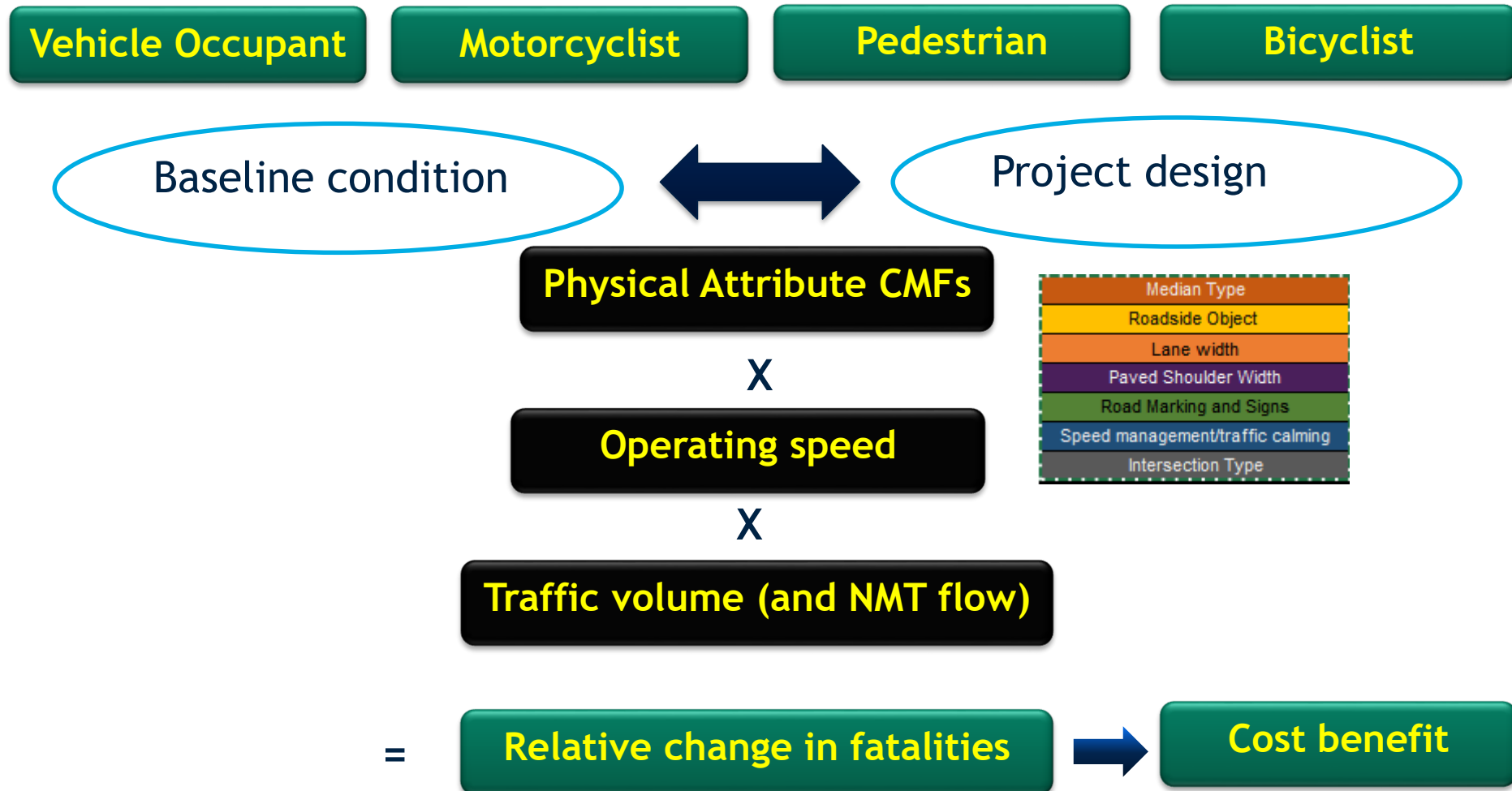
Road Safety Benefit

Road Safety Risk

## Outputs



# Overview of the Tool



# Managing projects to deliver road safety results

- Use the Tool early with designs in preliminary stage – negotiation and budget discussion with client
- Not use as pass/fail checklist, diagnose the issues iteratively to maximize the opportunity for improvement
- Not a substitute for audit or inspection process
- First priority on changing the road cross-section design and features
- Focus on separated facilities for vulnerable road users
- The second iteration of model improvement should focus on speed management (design change, warnings etc.)
- Beyond RSSAT, to further improve focus on non-engineering measures (enforcement, vehicle standards, post-crash, risk factors)

# Conclusion

- Tool still under internal development – pilot testing phase
- Team would be happy to test the Tool on planning/design stage projects (with available data)
- Opportunities to improve the model using available research data (applicability to LMIC environment)



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