

# Transportation System Network Replacement Project (TSNR)

## Overview

January 2020

# Agenda

- Current TSN
- TSNR Project Scope
- Why Replace TSN?
- Business Problems/Challenges in Current TSN
- TSNR Project Objectives
- Project Status

# Current System

# Current TSN

- Enterprise Oracle application
- Maintain and link traffic census, collision, and highway inventory data
- Base information system for all traffic safety analysis
- Maintain the Postmiles on State Highway System (SHS)
- Used by many functional areas across Caltrans
- Maintained by DRISI (Division of Research, Innovation, and System Information), Division of Traffic Operations, and IT (Information Technology)

# TSN Supported by Four Groups

## Division of Research, Innovation and System Information (DRISI)

- **Collision Coding:** Data from CHP, each collision located on network, information about each collision encoded. An average of 480,000 to 490,000 per year (all roads), 190,000 to 192,000 per year (SHS)
- **Highway Inventory:** Attributes of state highways, authoritative postmile reference. >16,000 centerline miles, >394,000 lane miles are tracked (number of lanes, medians, surface types, barrier types, etc.)

## Division of Traffic Operations (DTO)

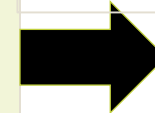
- **Traffic Volume and Census:** Traffic counts and types on all state highways
- **Safety:** Analysis to find statistically significant collision locations and types; Investigation to evaluate causes and engineer mitigation

Primary Goal



Safer Roadways

Other Key Uses



Postmile Authority

Roadway Characteristics

Highway Performance Evaluation

Legal Review

Federal Reporting

Safety  
Highway Characteristics  
Traffic

# TSN Supported by Four Groups

## Accident



- Locations
- Sequence of Events

## Highway



- Lane information
- Median information
- Shoulder information
- Many More

## Volume



- AADT
- Truck AADT
- Veh. Class. Counts

## TIRTS



- Traffic Investigation Reports (TIRs)

## Reports:

- Table B
- Table C, Regular and Wet
- TSAR
- Highway Sequence Listing (aka Postmile Log)

## Publications:

- Annual Collision Data on California State Highways
- Annual Traffic Volumes and Peak Hour Data

# Sources of Data

- DRISI

- TASAS (Traffic Accident Surveillance and Analysis System) Branch
  - Construction Plans
  - Permits, etc.
- Collision Coding Unit
  - California Highway Patrol (CHP)
    - Statewide Integrated Traffic Records System (SWITRS) database
    - Traffic Collision Reports (TCRs)

- DTO

- Traffic Data Branch
  - Data from the Districts
- Traffic Investigations Branch
  - Information from the Districts
  - Traffic Investigation Reports (TIRs)

# Reports

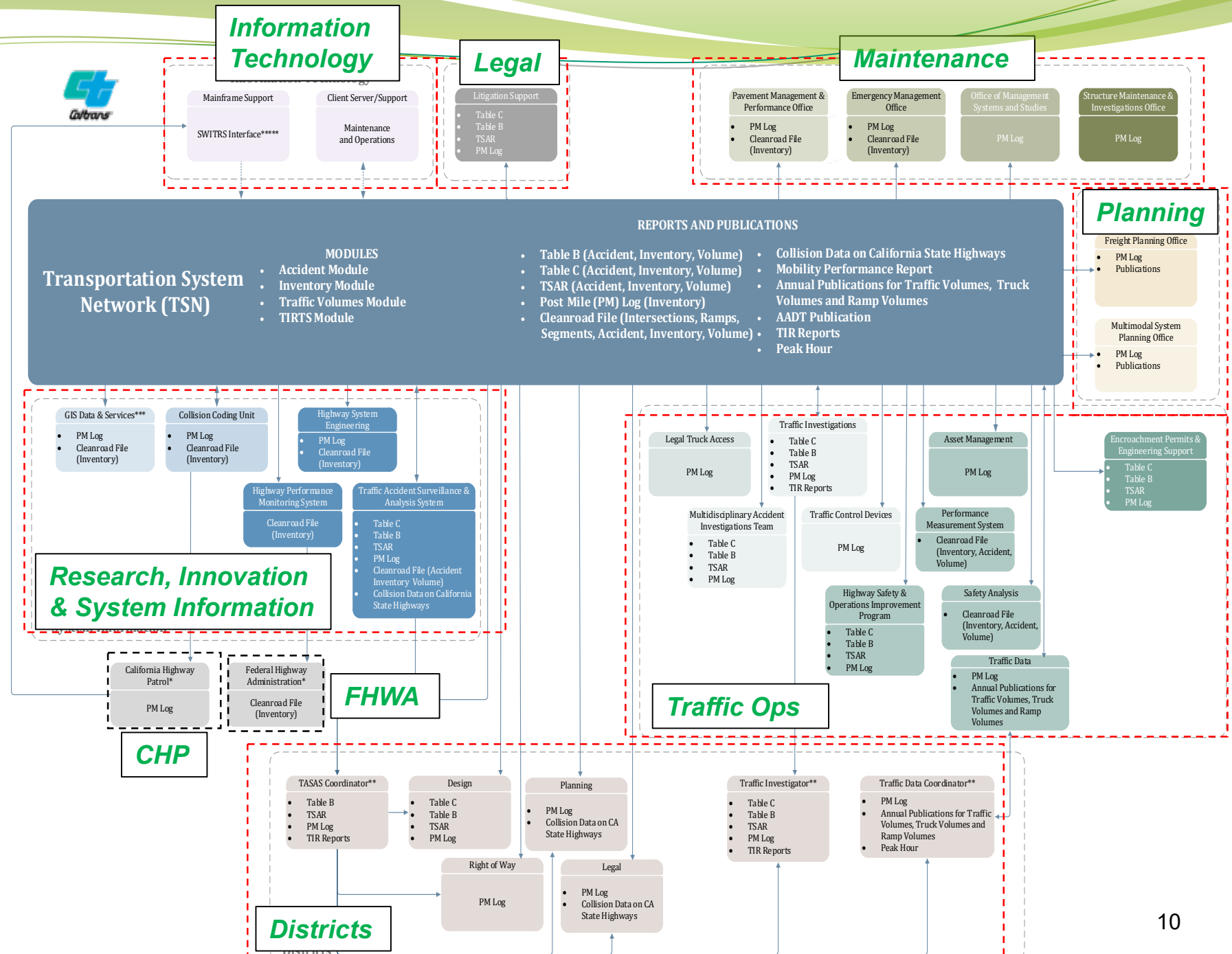
- Division of Research, Innovation, and System Information (DRISI) Reports
  - TASAS Branch
    - Table B - Selective accident rate calculation
    - Table C - High accident concentration locations
    - Wet Table C - High accident concentrations under wet conditions
    - TSAR (TASAS Selective Accident Retrieval) - A detailed list of accidents and/or summary of types of accidents on any section of highway, ramp, or intersection in the SHS
    - Highway Sequence Listing (aka Postmile Log)
  - Collision Coding Unit
    - Collision Data on California State Highways - Annual collision summaries on SHS
- Division of Traffic Operations (DTO) Reports
  - Traffic Data Branch
    - Annual Publications for Traffic Volumes and Truck Volumes
      - Traffic Volumes
      - Truck Traffic
    - Volumes and Peak Hour Volume Data
    - Monthly VMT
    - Mobility Performance
  - Traffic Investigations Branch
    - Safety and monitoring reports for Office of Performance
    - Significantly high accident concentrations locations: Quarterly reports



# Types of Usage

- A large number of users extract data (or receive data extracts) from TSN and manipulate the data for different purposes including:
  - GIS mapping (LRS tools)
    - Office of Data and Service Technology
  - Safety analysis
  - Inventory management
  - Strategic planning
  - HPMS Submittal (Highway Performance Monitoring System)
    - HPMS Branch
  - PaveM (Pavement Management System)
  - IMMS (Integrated Maintenance Management System)
- Tools used to transform TSN data
  - TOAD
  - FoxPro
  - MS Access
  - MS Excel
  - ArcMap
  - PeMS
- Transformed Data forms
  - Adobe PDF
  - Shapefiles
  - KML Files
  - Esri Geodatabase

# Current TSN Application Diagram



# Proposed System

# TSNR Project Scope

Replace the Transportation System Network to meet federal Moving Ahead for Progress in the 21st Century Act (MAP-21) and Fixing America's Surface Transportation (FAST) Act which will add temporal, geospatial capability, and enhance safety analysis to the system

This helps improve roadway safety, reduce fatalities, and injuries for all road users on all public roads; and support the "Toward Zero Deaths" goal.

# Why replace TSN?

- Safety
- Federal Requirements:
  - Moving Ahead for Progress in the 21st Century Act (MAP-21)
  - Fixing America's Surface Transportation (FAST) Act
- TSN outdated system
- State Highway System data only

# Business Problems/Challenges

## I. Inability to Meet Federal Mandates:

### MAP-21 & FAST Act (23 U.S.C. 119(e)(1))

Development of a safety data system that can:

- Link collision, roadway and traffic data by geolocation
- Identify fatalities and serious injuries on all public roads
- Retain temporal and historical data
- Report on MIRE FDE data
- Support Performance Measures (PM)
  - PM 1: HSIP and Safety Performance Management
  - PM 2: Pavement and Bridge Condition
  - PM 3: System performance/Freight/CMAG

Required by 2026



### Current TSN

- No geolocation
- No collision, roadway, and traffic volume data on local roads.
- No bike/ped data

# Business Problems/Challenges

## II. Inefficiencies in Current Program Operations:

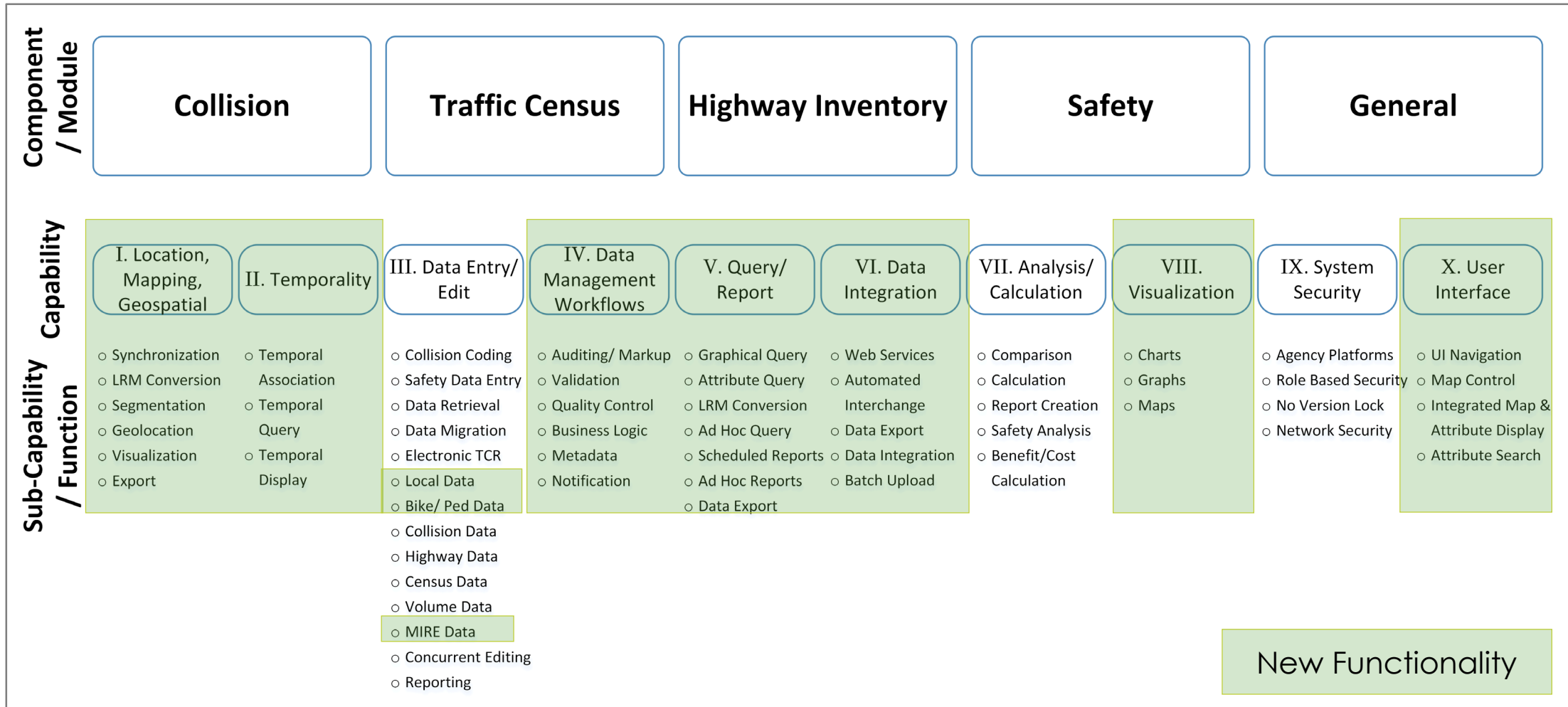
- No Geo-Spatial Enabled Capability
- Obsolete User Interface
- No Ad-hoc Reporting Capability
- Not a Centralized System of Record for Data
- Inefficient Linear Referencing Data Exchange
- Inefficient Traffic and Collision Data Exchange
- Lacking Bicycle and Pedestrian Data
- Slow Updates, Complex Data Governance

# TSNR Project Objectives

- Geolocation
- Store temporal and historical safety data
- Data exchange capability with external agencies
- Centralized repository of inventory, traffic, collision data, and ped/bike data on all public roads
- Fully integrate postmile system



# Vision For The TSNR (New TSN)

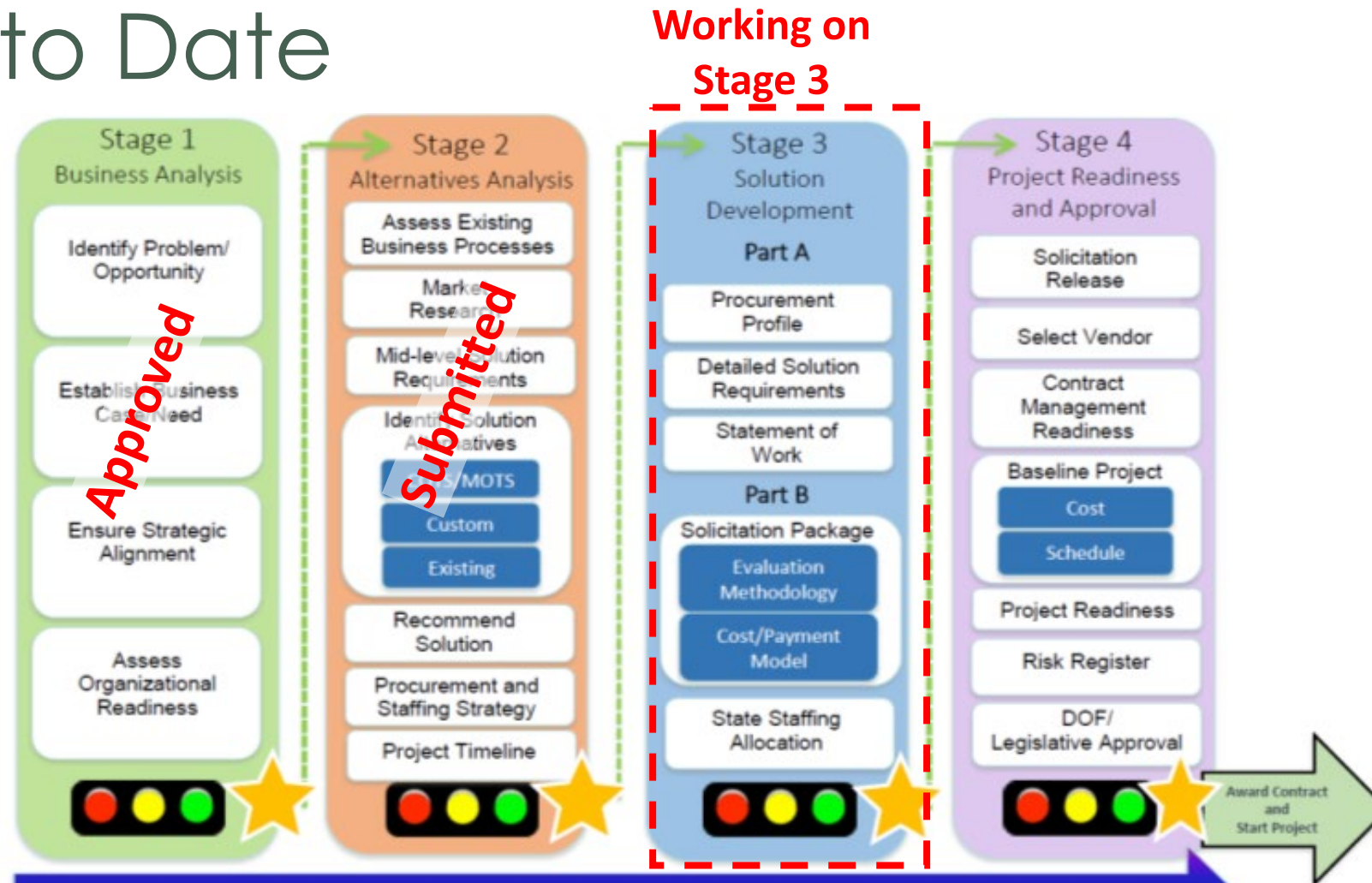


New Functionality

# Risk of Not Implementing TSNR

- Non-compliance with MAP-21 and the FAST Act
- More than \$200 million of federal funds
- Missed opportunity to achieve Caltrans' goal
  - Safety toward Zero Death

# Progress to Date



# Collaboration and Oversight

# Project Strategy

- Focus on Linear Referencing System (LRS), roadway, and crash data
- Provide the ability for data sharing among the different state and local agencies
- Continued collaboration with traffic collision data from California Highway Patrol (CHP)



# Thank you.

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