

APPENDIX VII: ADDITIONAL INFORMATION ABOUT ROADWAY SYSTEM PERFORMANCE

TRANSPORTATION PERFORMANCE MANAGEMENT

The Moving Ahead for Progress in the 21st (MAP-21) is the Federal transportation funding bill signed into law in 2012. A key feature of MAP-21 is the establishment of a performance-and outcome- based program, known as “Performance Based Planning”, with the objective to invest in projects that will make progress toward the achievement of the national goals for the transportation. The most recent Federal transportation bill, Fixing America’s Surface Transportation Act of 2016 (FAST Act), carries forward the same performance management framework. The Federal Highway Administration (FHWA) worked with state and regional agencies to identify performance measures that meet the requirements. Beginning in 2018, state Departments of Transportation (DOTs) and Metropolitan Transportation Organizations (MPOs) will be required to implement the Federal performance measures.

Transportation Performance Management (TPM) is defined by FHWA as a strategic approach that uses information to make investments and policy decisions to achieve national performance goals. Three sets of performance measures are part of the TPM Regulations as “Performance Management” (PM):

- PM 1: Safety Measures
- PM 2: Infrastructure Measures (Pavement/Bridge)
- PM 3: System Performance Measures

State DOTs, such as Caltrans, are responsible for submitting performance targets and periodic reports on progress to those targets to FHWA. MPOs, such as KCAG, are required to establish targets for the same performance measures for the MPOs’ planning area within 180 days after the state establishes each target. MPOs may elect to support the statewide targets, establish numerical targets specific to their region, or use a combination of both approaches. For MPOs, these targets must be incorporated into their planning process, which includes their Transportation Improvement Program (TIP) and Regional Transportation Plan (RTP).

SAFETY PERFORMANCE MEASURES (PM 1)

FHWA issued the Safety Performance Management Final Rule (Safety PM) as an implementation of the Highways Safety Improvement Program (HSIP), effective April 14, 2016. The Safety PM identified the core Federal safety goal “to achieve a significant reduction

in traffic fatalities and serious injuries on all public roads.” The Safety PM establishes five performance measures to carry out the HSIP, defined as five-year rolling averages for:

Number of Fatalities

1. Number of Fatalities
2. Rate of Fatalities per 100 million Vehicle Miles Traveled (VMT)
3. Number of Serious Injuries
4. Rate of Serious Injuries per 100 million VMT
5. Number of Non-Motorized Fatalities and Non-Motorized Serious Injuries

STATEWIDE SAFETY TARGETS

Caltrans’ approach to setting targets was guided by the Safety PM as well as the Caltrans Strategic Highway Safety Plan (SHSP) and Strategic Management Plan (SMP). In cooperation with the Office of Traffic Safety (OTS), Caltrans adopted five Safety Performance Management Targets:

1. Number of Fatalities
2. Rate of Fatalities (per 100 million VMT)
3. Number of Serious Injuries
4. Rate of Serious Injuries (per 100 million VMT)
5. Number of Non-Motorized Fatalities and Non-Motorized Serious Injuries (Bicycle and Pedestrians)

Caltrans’ methodology for target setting included three steps, which are: (1) estimating the existing trends to determine where we are now, (2) determining what external factors will impact the target in order to forecast future trends, and (3) to estimate targets based on forecasted fatality reductions from safety plans.

Caltrans considered external factors that could affect collision, fatality and serious injury rates on public roads. This analysis referenced an active National Cooperative Highway Research Project (NCHRP) 17-67 titled, “Identification of Factors Contributing to the Decline of Fatalities in the United States.”, which preliminarily determined that economic factors contribute up to 85% of the variation of collisions on a yearly basis. Factors, such as Unemployment and per capital Gross Domestic Product (GDP) growth, can account for majority the variation in collision trends. To accurately forecast future collision trends, the difficult task of forecasting the economy with political and economic uncertainties would be required.

In forecasting trends, Caltrans elected to take a more straightforward approach by taking currently existing data for previous years and extrapolating these values to get the remaining and current years. Caltrans also used a vision-based or “aspirational” target setting approach consistent with the SHSP and SMP, such as the Toward Zero Deaths principle.

The number of fatalities and rate of fatalities can be obtained from historical data from National Highway Traffic Safety Administration’s (NHTSA) Fatality Analysis Reporting System (FARS), which records data on all public roads. Rate of fatalities is calculated using Vehicle Miles Traveled (VMT) from the Highway Performance Monitoring System (HPMS). Serious injury data is gathered from California Highway Patrol’s (CHP) Statewide Integrated Traffic Records System (SWITRS), which includes data from local law enforcement agencies on all public roads. Rate of serious injuries is calculated using VMT from HPMS. Non-motorized fatalities are sourced from FARS and non-motorized serious injuries are from SWITRS. The target is an aggregate of both fatalities and serious injuries from non-motorized modes (i.e., pedestrian and bicyclists).

INFRASTRUCTURE PERFORMANCE MEASURES (PM 2)

The second group of TPM known as “Performance Management 2” or PM 2 is for infrastructure performance, more specifically pavement and bridges, made effective May 20, 2017. These measures assess the conditions of transportation systems and help identify statewide investments to maintain pavement and bridges on the National Highway System (NHS). PM 2 targets are for the purpose of carrying out the National Highway Performance Program (NHPP).

There are six federally mandated performance measures:

1. Percentage of Interstate pavements in Good condition
2. Percentage of Interstate pavements in Poor condition
3. Percentage of non-Interstate NHS pavement in Good condition
4. Percentage of non-Interstate NHS pavements in Poor condition
5. Percentage of NHS bridges in Good condition
6. Percentage of NHS bridges in Poor condition

Conditions are based on standardized metrics defined by the federal performance management regulations, which outlines measurements and calculation methods for each metric resulting in a “Good”, “Fair”, or “Poor” condition. For pavement conditions, there are four metrics: roughness (based on the international roughness index or IRI), cracking, rutting, and faulting (for concrete pavement). A pavement segment is in “Good” condition when all the metrics are rated as “Good”, “Poor” condition when two or more metrics are rated as “Poor”, and “Fair” for any other combination of ratings.

Bridge conditions are based on the National Bridge Inventory (NBI) rating scale which considers the condition rating of: deck, superstructure, substructure, and culverts. The NBI rating scale runs from 0 to 10 where 7 or above is "Good", 6 to 5 is "Fair", and 4 or below is "Poor".

STATEWIDE PM 2 TARGETS

Caltrans developed the California Transportation Asset Management Plan (TAMP), adopted in March 2018, which implemented the PM 2 framework established by FHWA. The TAMP assesses the current conditions of California's transportation assets, establishes performance measures, and identifies statewide investment strategies to achieve the performance measures. As part of FHWA's TAMP requirements, State DOTs must specify their desired state of repair for the 10-year analysis period of the TAMP.

SYSTEM PERFORMANCE MEASURES (PM 3)

The final performance management category of TPM is "Performance Management 3" or PM 3, which consists of seven performance measures related to the performance of the Interstate and non-Interstate NHS pursuant to: the National Highway Performance Program (NHPP); assessing freight movement on the Interstate System; and assessing traffic congestion and on-road mobile source emissions for the purpose of carrying out the Congestion Mitigation and Air Quality (CMAQ) Improvement Program. The seven measures for PM 3 are:

Performance of the NHS

1. Percent of person-miles traveled on the Interstate that are reliable
2. Percent of person-miles traveled on the non-Interstate NHS that are reliable
3. Percent change in tailpipe CO₂ emissions on the NHS compared to the calendar year 2017 level

Freight Movement on the Interstate System

4. Truck Travel Time Reliability (TTTR) Index

CMAQ Program Traffic Congestion and On-Road Mobile Sources

5. Annual Hours of Peak Hour Excessive Delay (PHED) Per Capita
6. Percent of Non-Single Occupancy Vehicle (SOV) Travel
7. Total Emissions Reduction

The first two measurements of PM 3 (Percent of person-miles traveled on the Interstate and non-Interstate NHS that are reliable) are measured by the Level of Travel Time Reliability

(LOTTR). LOTTR is defined as "...a comparison, expressed as a ratio, of the 80th percentile travel time of a reporting segment to the "normal" (50th percentile) travel time of a reporting segment occurring throughout a full calendar year." A segment is considered unreliable when the LOTTR ratio is greater than 1.5.

Percent change in tailpipe CO2 emissions on the NHS compared to the calendar year level is the third measure among the PM 3 targets, referred to as the GHG measure. The GHG measure is described in the federal regulations as the change in the total tailpipe CO2 emissions on the NHS for the 2 preceding calendar years of the target setting year.

Truck Travel Time Reliability (TTTR) Index is the fourth measure required under PM 3. This performance measure assesses freight movement on the Interstate System and uses metrics that considers truck travel times for each period of the day.

The fourth measure is Annual Hours of Peak Hour Excessive Delay (PHED) Per Capita, which is referred to as the PHED measure. Annual Hours of PHED is defined by federal regulations as " the cumulative hours of excessive delay...experienced by all people traveling through all reporting segments during peak hours in the applicable urbanized area for the full reporting calendar year."

Percent of Non-SOV Travel is the fifth measure, which essentially is the percentage of travel that is not occurring by driving alone in a vehicle, including travel avoided by telecommuting.

The last measure of PM 3, Total Emissions Reduction, tracks the reductions from all projects reported to the CMAQ Public Access System, which is a database of projects funded by CMAQ with the goal of improving air quality and congestion. This measure consists of multiple targets for each applicable pollutant under the CMAQ program. These targets are calculated by summing the total estimated emissions reductions for each criteria pollutant and precursor, in kilograms per day, for all projects funded with CMAQ funds.

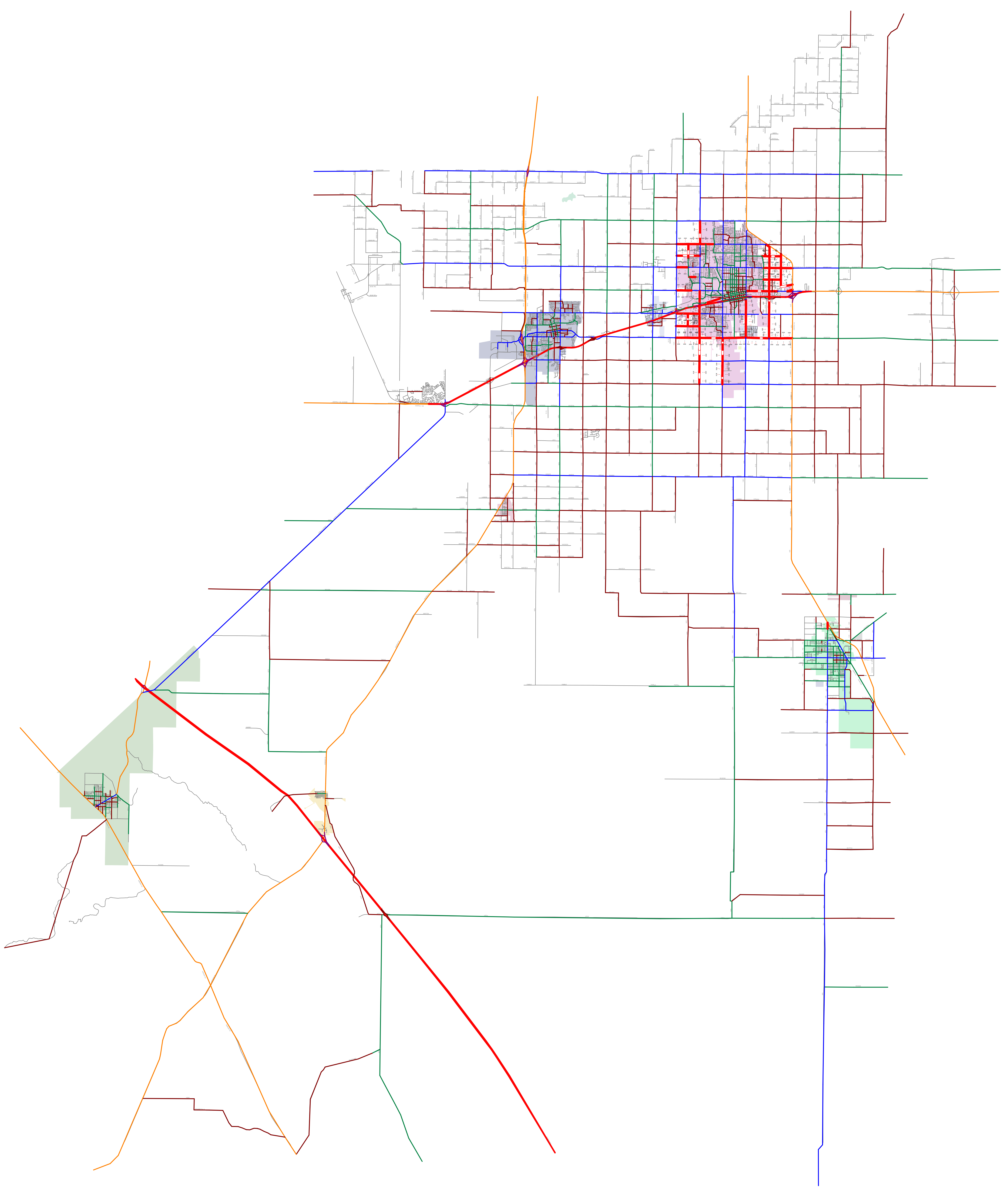
STATEWIDE PM 3 TARGETS

Caltrans is required to establish performance targets for each PM 3 measure, and MPOs must either support the statewide targets or establish their own regional targets. For the GHG measure, Caltrans must establish targets and MPOs must either support the statewide targets or establish their own regional targets.

NETWORK IMPROVEMENTS

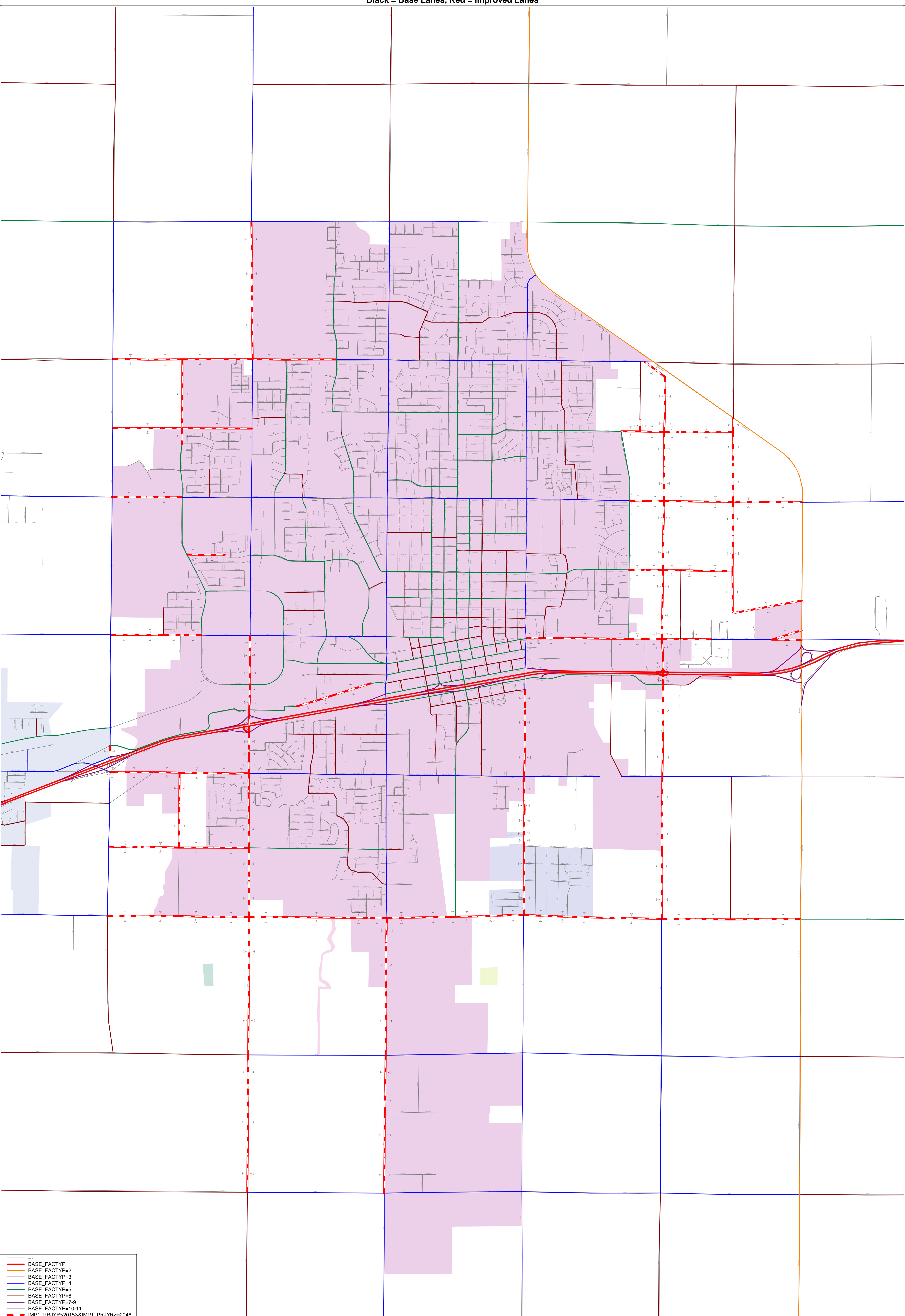
Roadways anticipating improvements are included on the following pages. Details about these improvements are included in the main body of the RTP/SCS.

Kings County Model
Network Improvements
Black = Base Lanes, Red = Improved Lanes



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- BASE_FACTYP=1
- BASE_FACTYP=2
- BASE_FACTYP=3
- BASE_FACTYP=4
- BASE_FACTYP=5
- BASE_FACTYP=6
- BASE_FACTYP=7-9
- BASE_FACTYP=10-11
- IMP1_PRJYR>2015&&IMP1_PRJYR<=2046

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Network Improvements
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