



SUSTAINABILITY & GREEN DESIGN



City of Lodi



Storm Water Workshop Thursday, November 5, 2009

LID Success *“Green Streets”*





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why?

- Creative ways to:
 - Maintain / Restore Storage Volume
 - interception, channel, depression
 - Maintain / Restore Infiltration Volume
 - Maintain / Restore Evaporation Volume
 - Maintain / Restore Runoff Volume
 - Maintain Flow Paths
 - Supplement Water Use



current methods/limitations

- Economics
 - Cost of Maintaining a Growing / Aging Infrastructure
- New Objectives (Public Health / Ecological)
 - Source Water, Living Resources /Streams
 - Regulations
 - NPDES / TMDL's / ESA





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LID ~ creative techniques



- Bioretention / Rain Gardens
- Strategic Grading
- Site Finger Printing
- Resource Conservation
- Flatter Wider Swales
- Flatter Slopes
- Long Flow Paths
- Tree / Shrub Depression
- Turf Depression
- Landscape Island Storage
- Rooftop Detention /Retention
- Roof Leader Disconnection
- Parking Lot / Street Storage
- Smaller Culverts, Pipes & Inlets
- Amended soils
- Alternative materials
- Tree Box Filters
- Alternative Impervious Surfaces
- Reduce Impervious Surface
- Surface Roughness Technology
- Rain Barrels / Cisterns / Water Use
- Catch Basins / Seepage Pits
- Sidewalk Storage
- Vegetative Swales, Buffers & Strips
- Infiltration Swales & Trenches
- Eliminate Curb and Gutter
- Shoulder Vegetation
- Maximize Sheet flow
- Maintain Drainage Patterns
- Green Roofs
- Reforestation
- Pollution Prevention





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rain gardens



- **Advantages**
 - Captures low flow
 - Urban retrofit
 - Aesthetics
 - Pollutant removal
- **Disadvantages**
 - Small drainage areas
 - Maintenance





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rain gardens





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rain gardens





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Rain gardens



bioswale/vegetated swale

- **Advantages**
 - Landscape area
 - Pollutant removal
 - Reduces need for stormwater piping
 - Low maintenance
- **Disadvantages**
 - Mosquitos
 - Low/Medium pollutant removal





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bioswale/vegetated swale

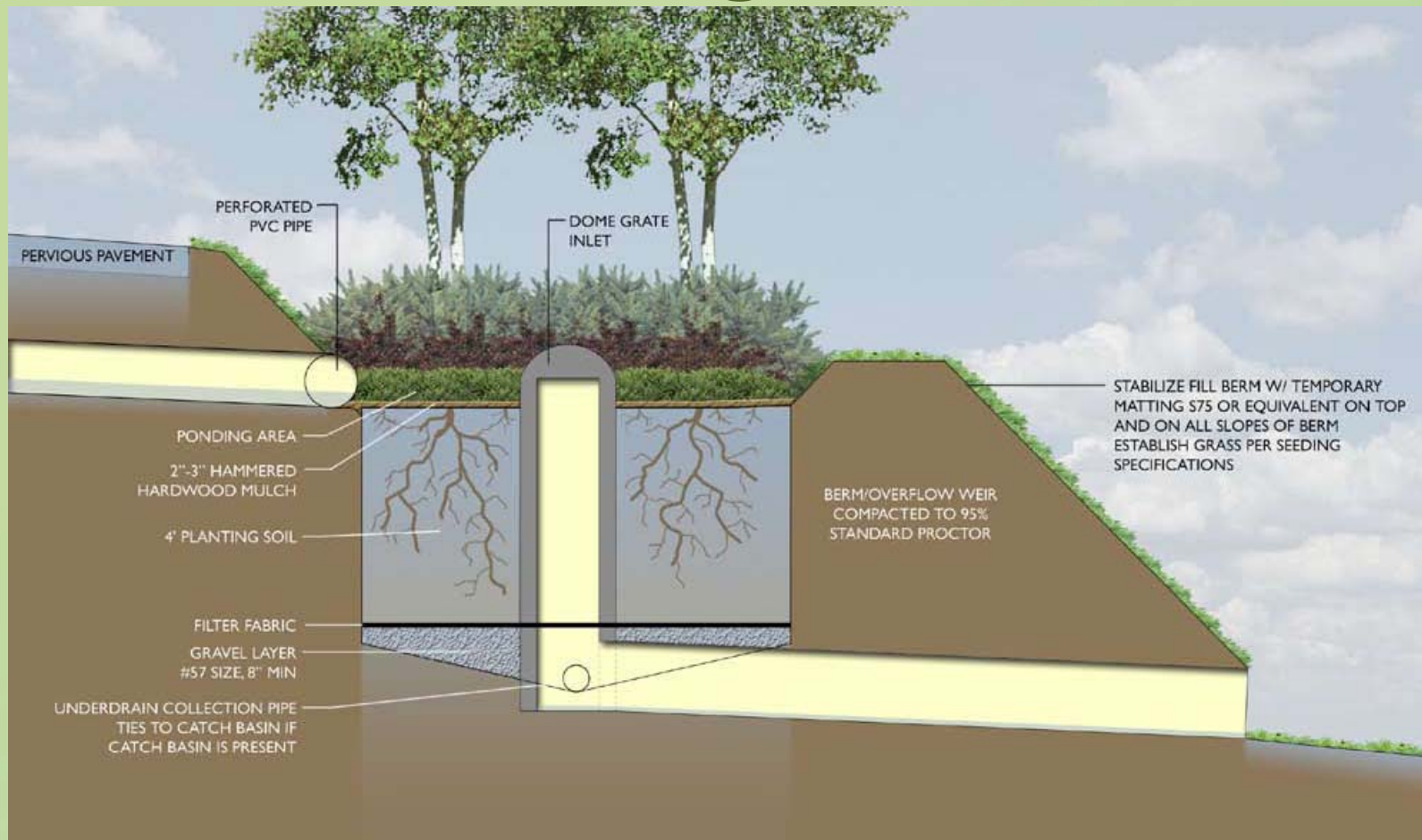




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bioswale/vegetated swale

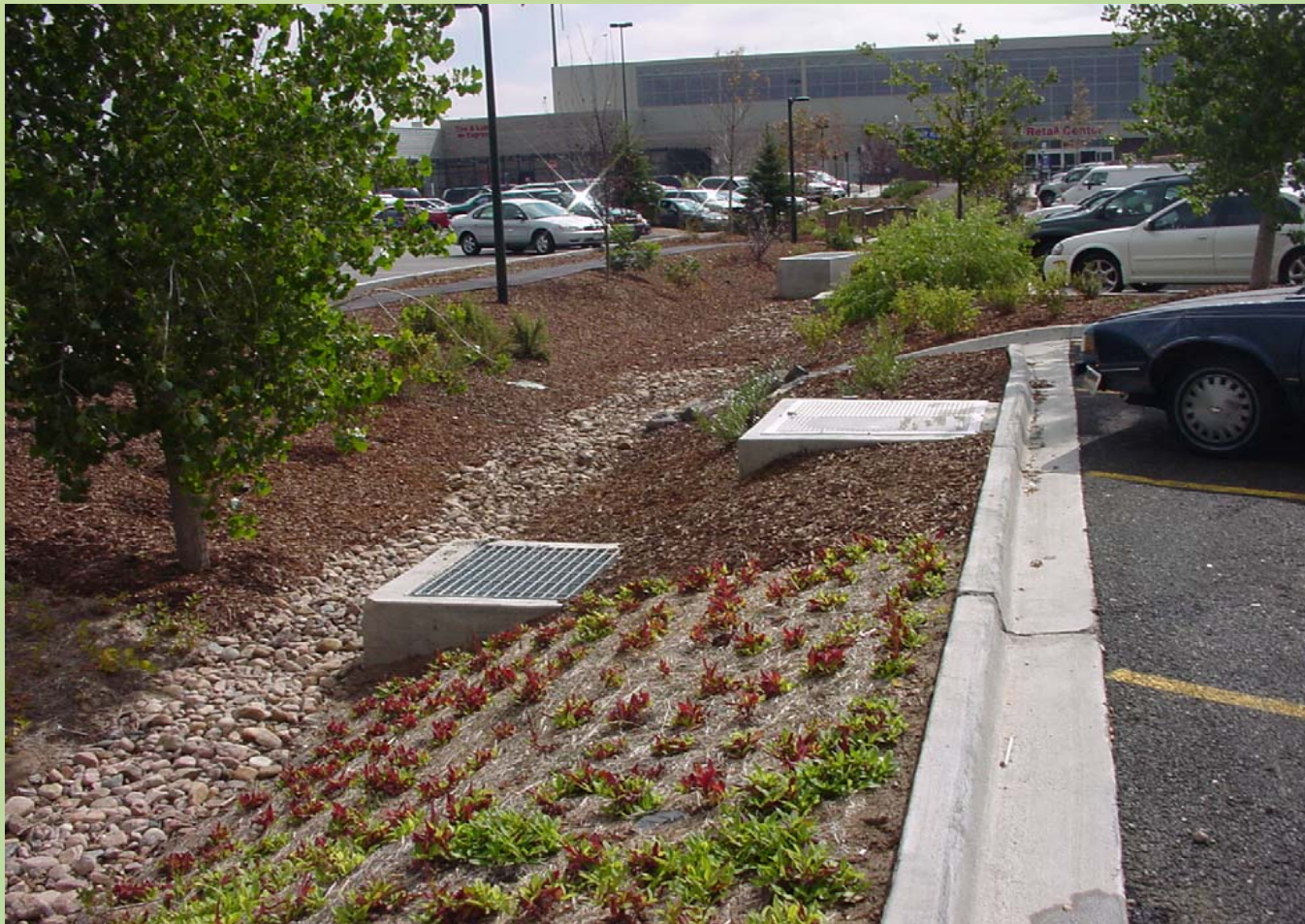




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bioswale/vegetated swale

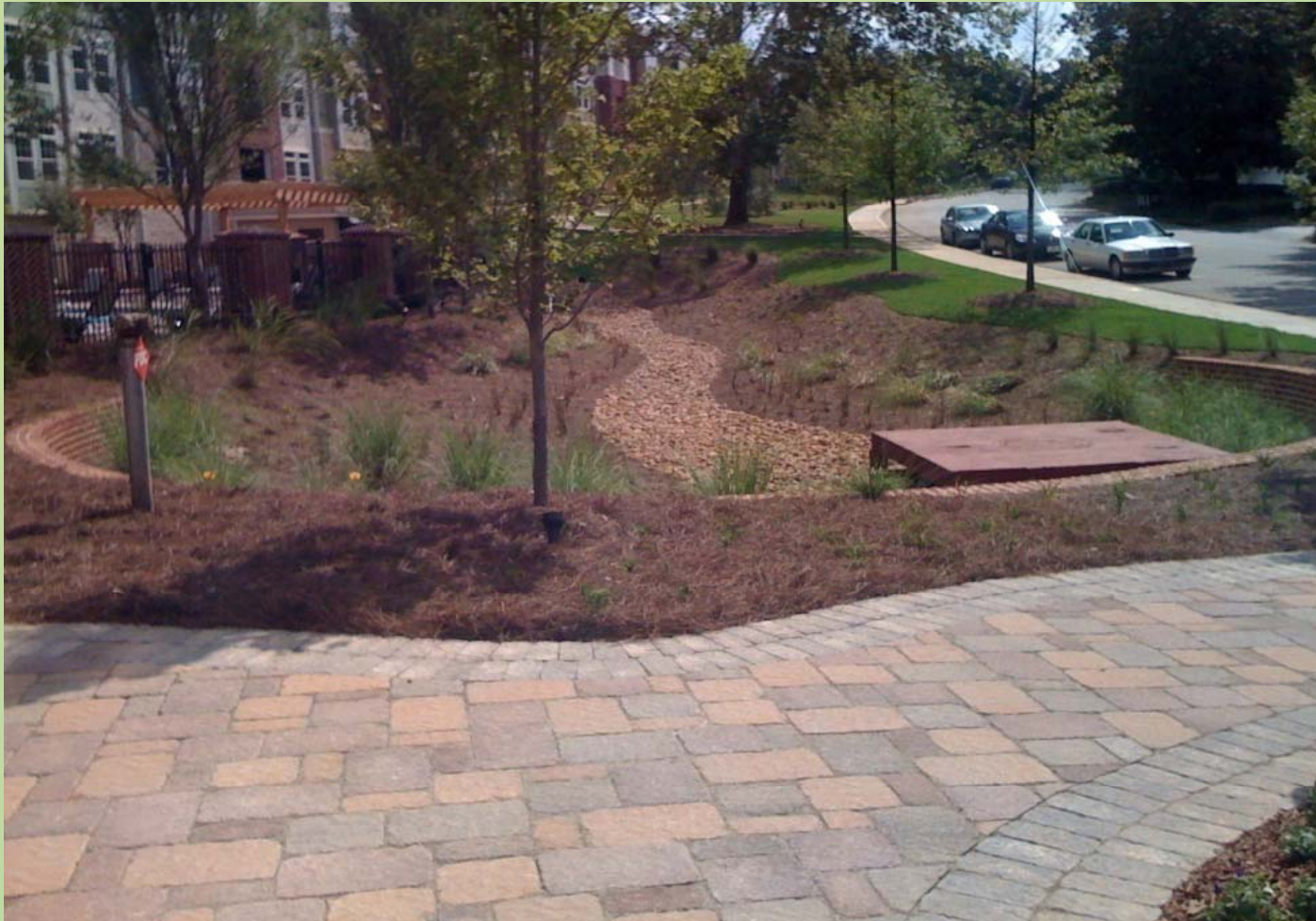




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bioswale/vegetated swale





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porous/permeable pavement



STF POROUS PAVING





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porous/permeable pavement





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porous/permeable pavement





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porous/permeable pavement

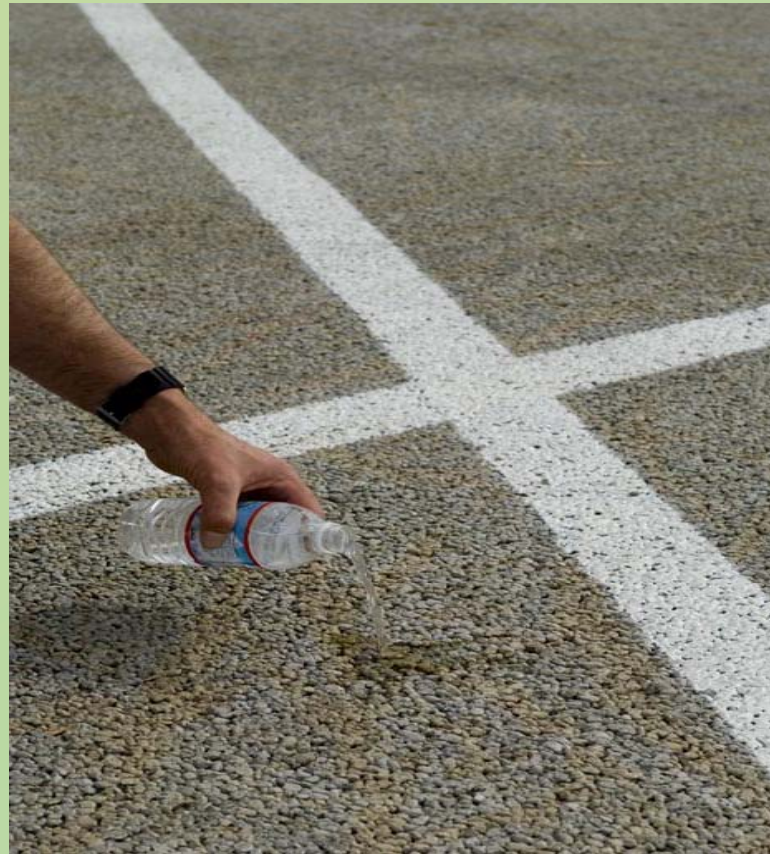




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porous asphalt/pervious concrete





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porous asphalt/pervious concrete







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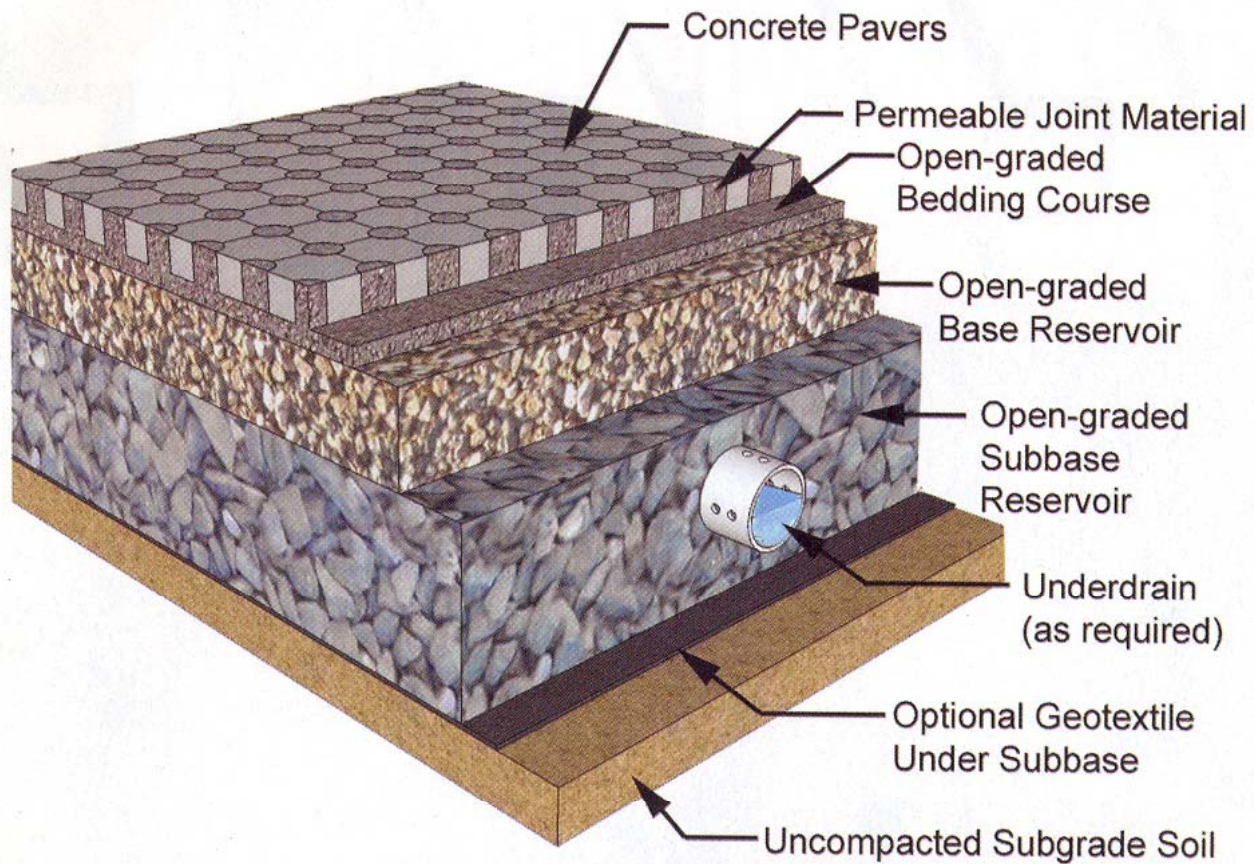


permeable brick pavers



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permeable brick pavers





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permeable brick pavers





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Success!





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Success!





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Success!





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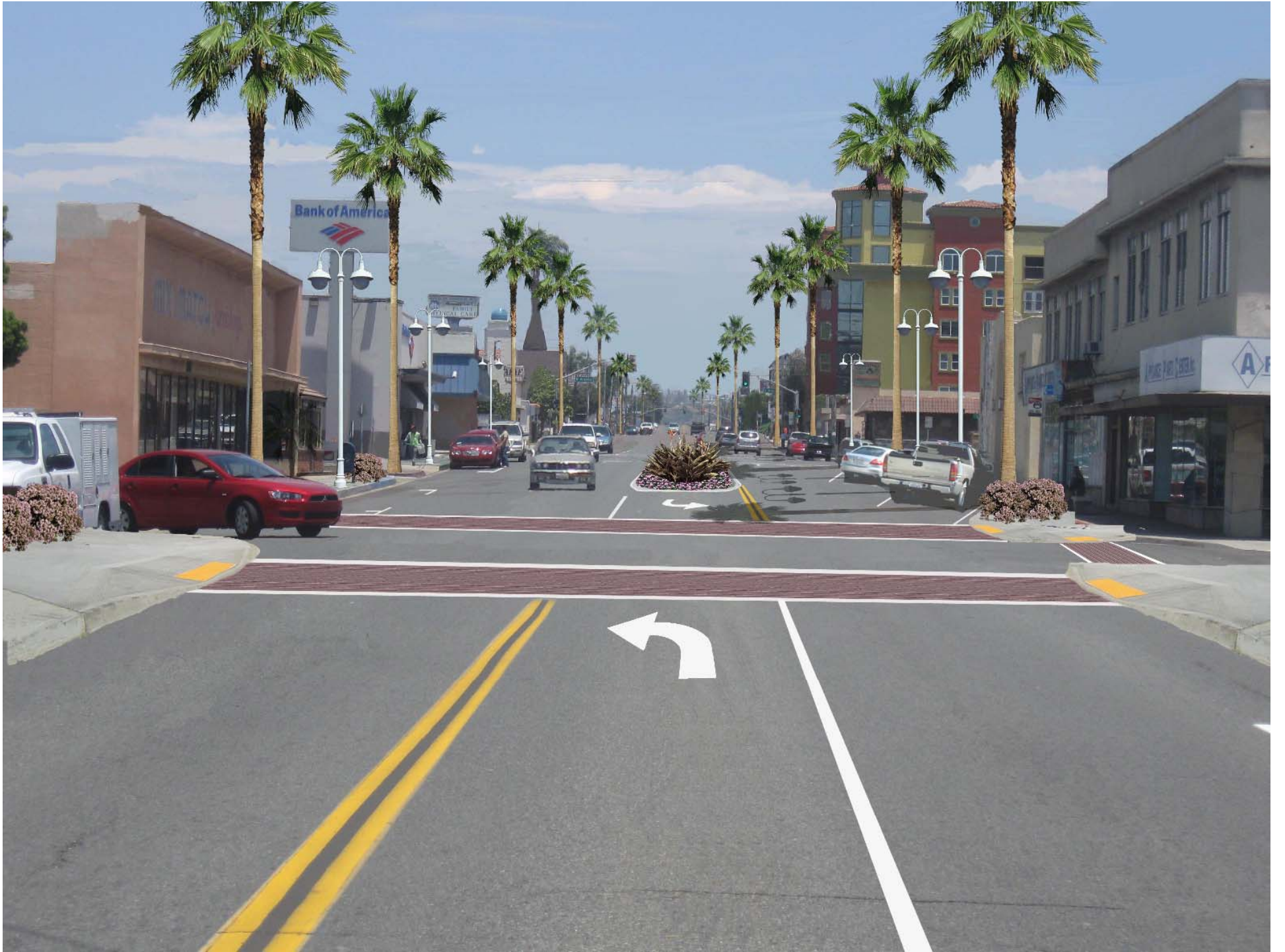
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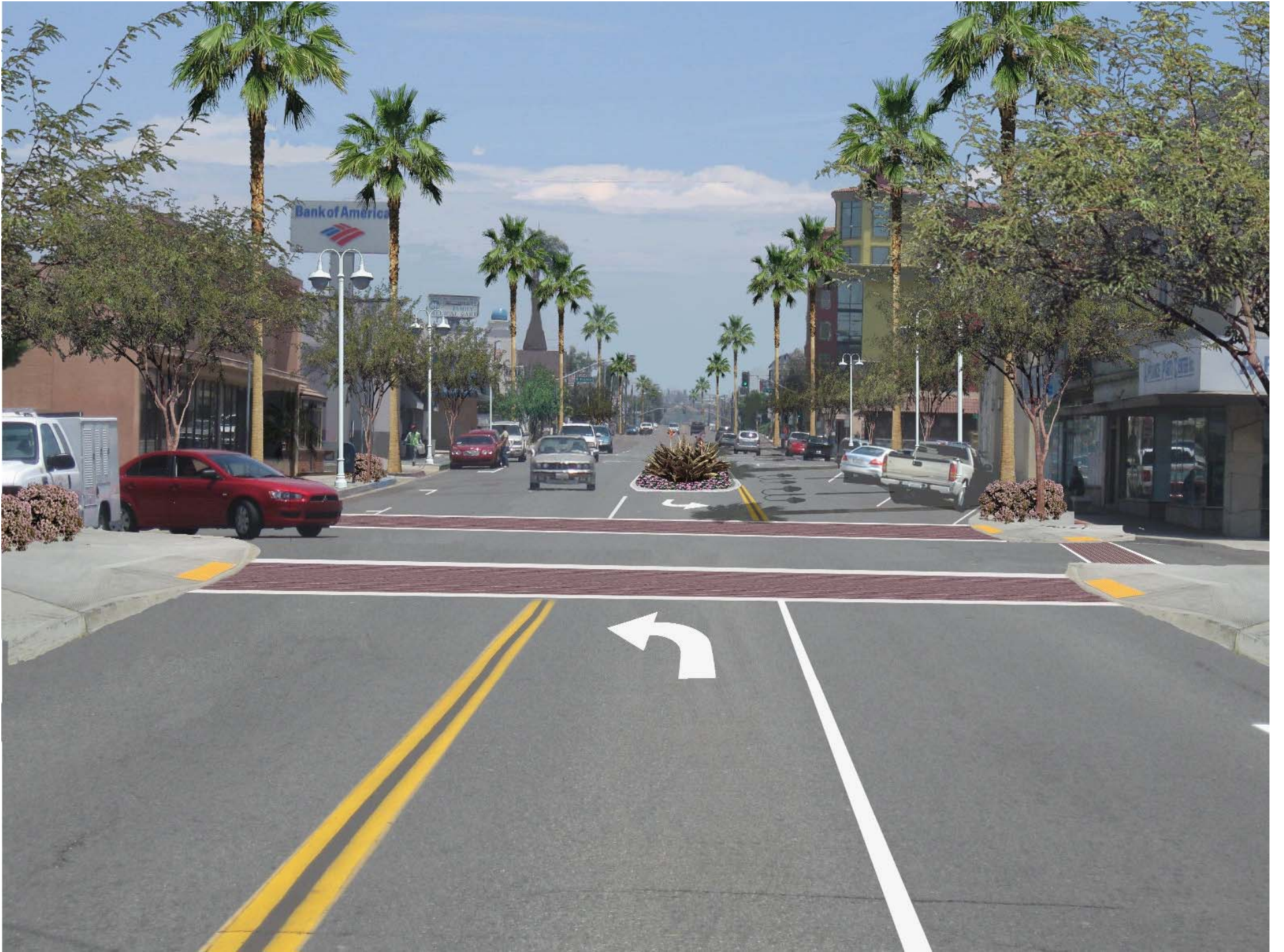










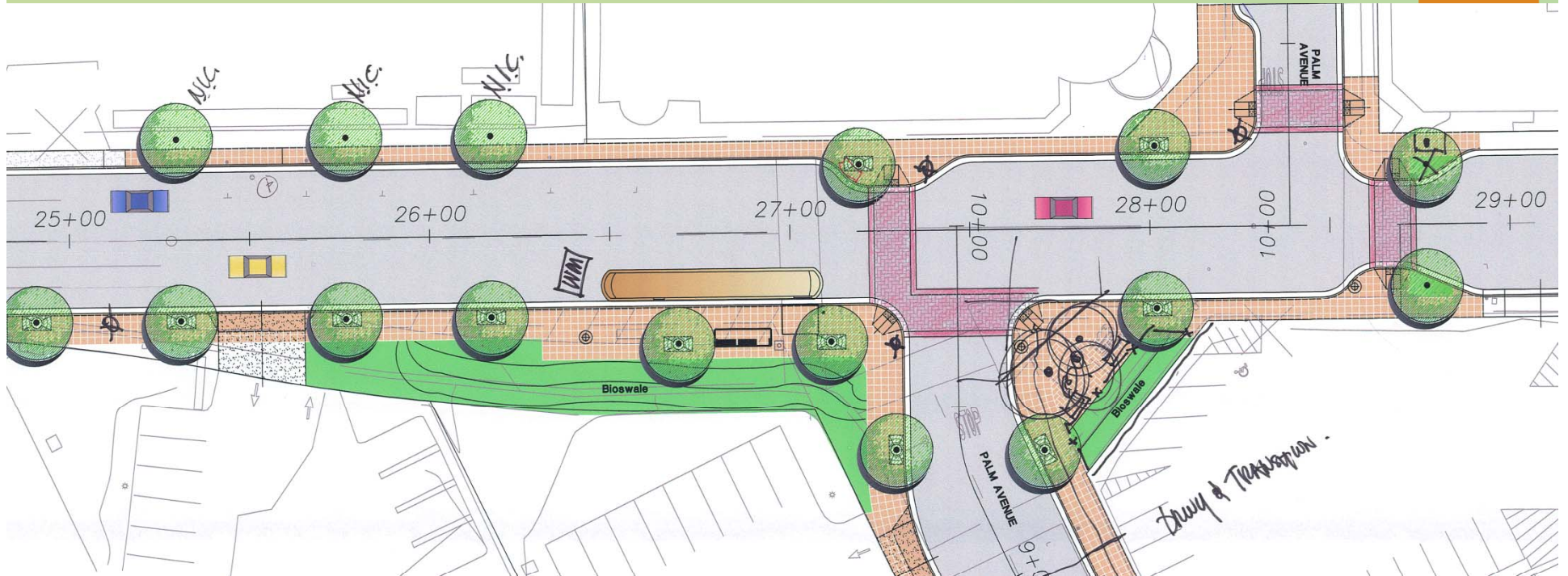




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project example





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questions?

