

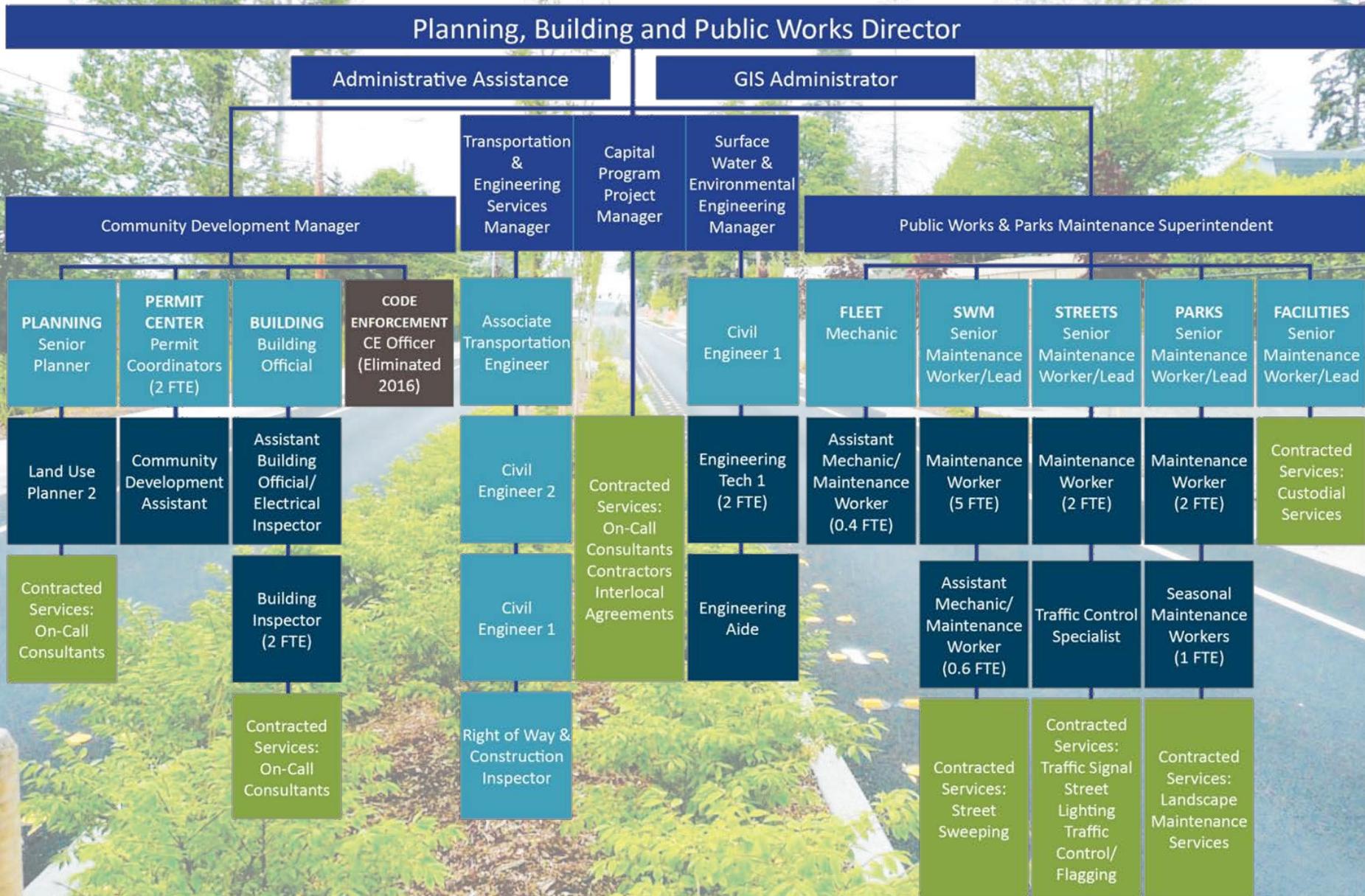


# City Government 101

PLANNING, BUILDING, & PUBLIC WORKS

Part 9b: Engineering Services

# Department Organization

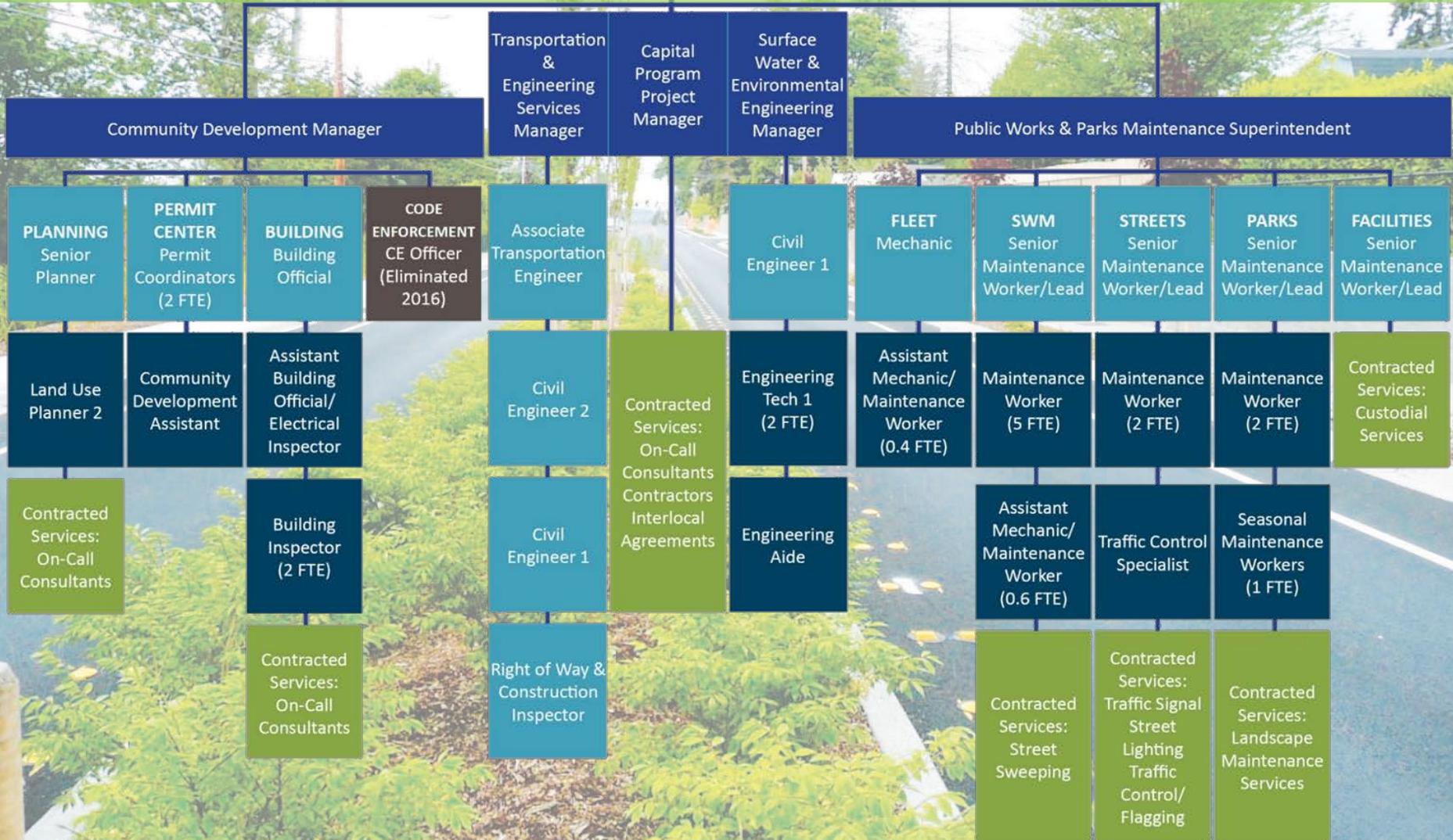


# Department Organization

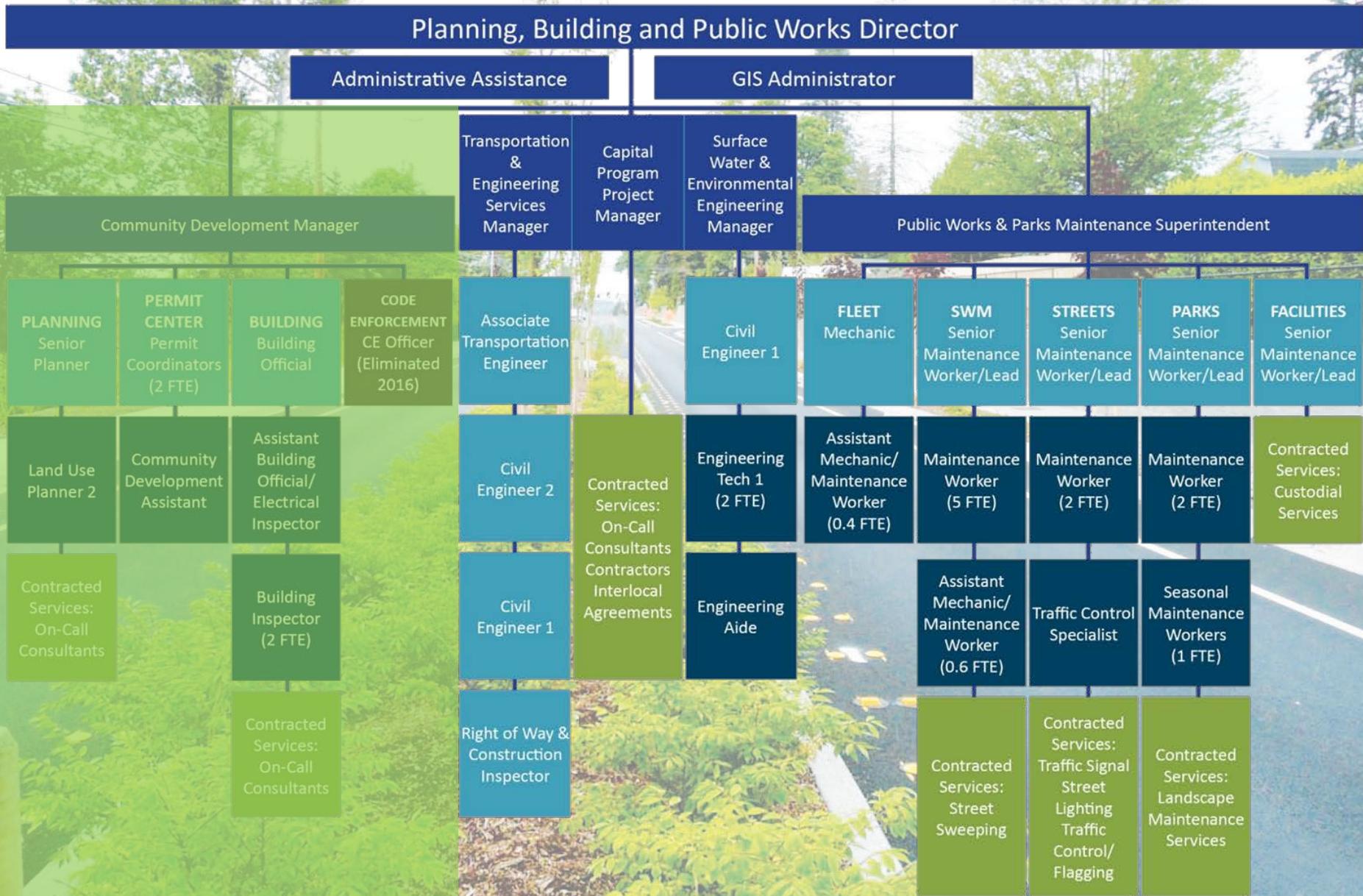
Planning, Building and Public Works Director

Administrative Assistance

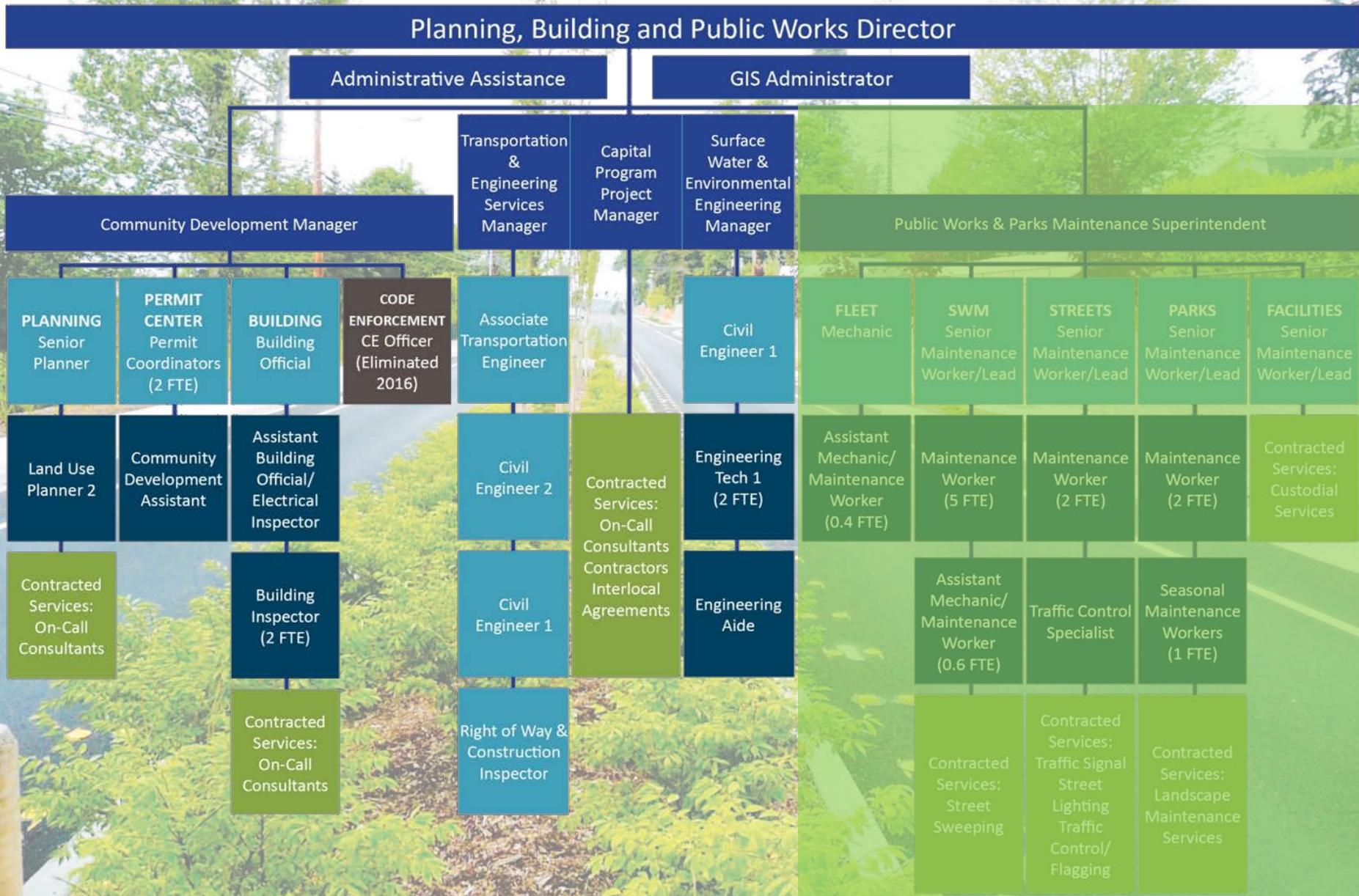
GIS Administrator



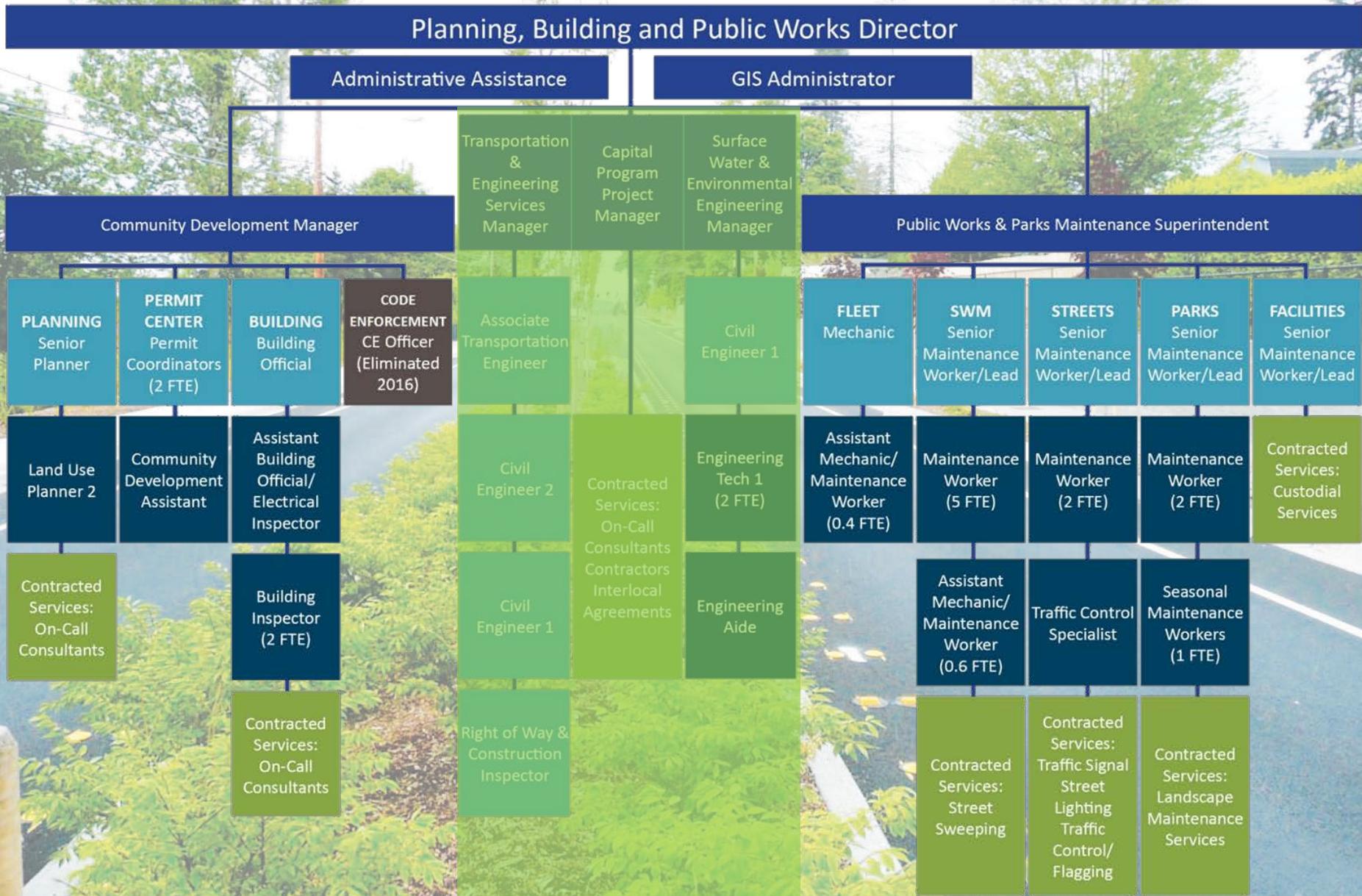
# Department Organization



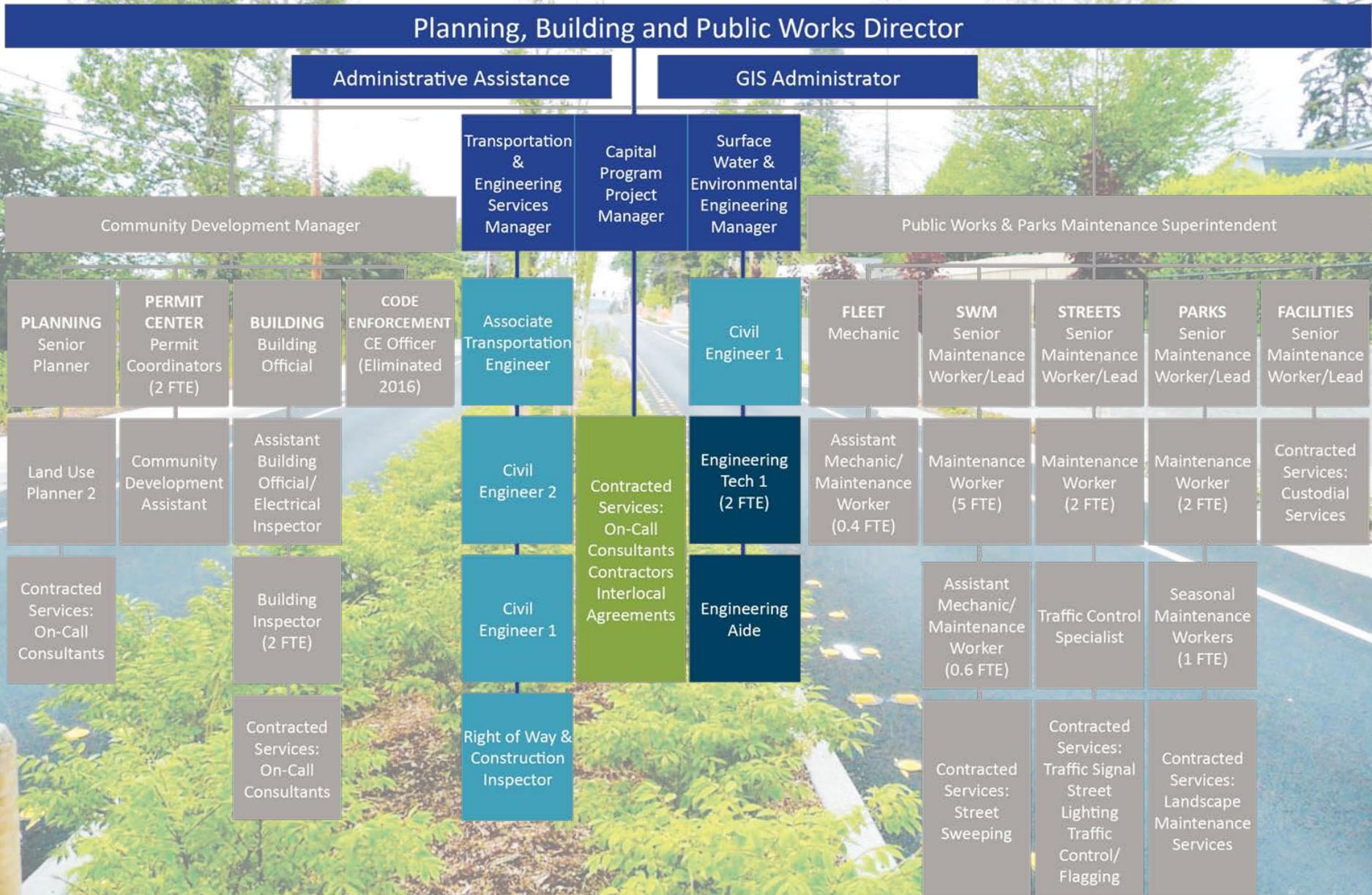
# Department Organization



# Department Organization



# Division Organization



# Team Organization | Engineering Services

Transportation &  
Engineering Services Manager

Capital Program  
Project Manager

Surface Water & Environmental  
Engineering Manager

Associate Transportation  
Engineer

Civil  
Engineer 1

Civil  
Engineer 2

Engineering Tech 1  
(2 FTE)

Civil  
Engineer 1

Contracted Services:  
On-Call Consultants  
Contractors  
Interlocal Agreements

Right of Way &  
Construction Inspector

Engineering Aide

# Transportation & Engineering Services

## Overview

- **Primary Function and Responsibility**
  - *Traffic Operations & Safety*
  - *Infrastructure Management*
  - *Emergency Management*
  - *Liability & Risk Management*
- **Secondary Functions**
  - *Capital Improvement Projects*
  - *Development Services*
  - *Special Events*
- **Coordination**
- **Planning**



# Transportation & Engineering Services

## Primary Function & Responsibility

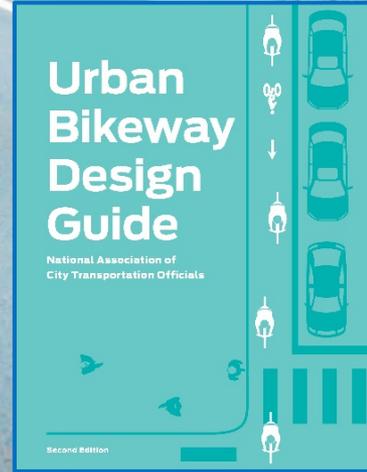
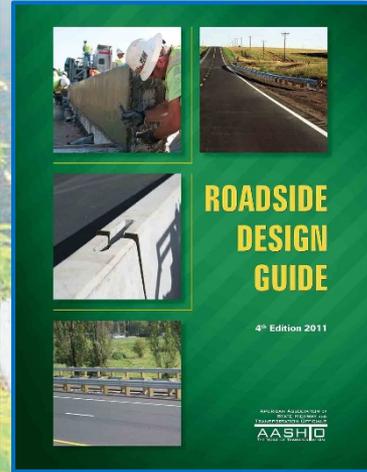
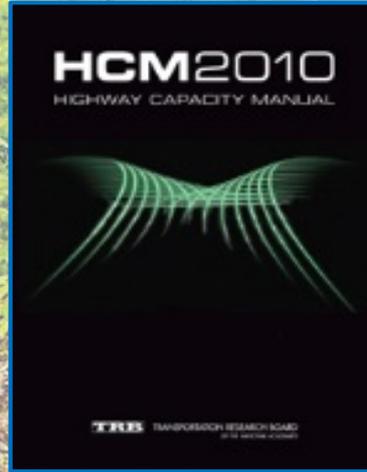
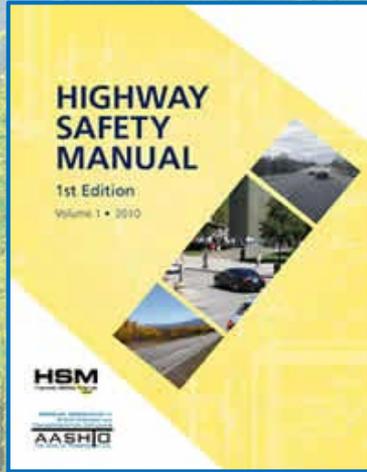
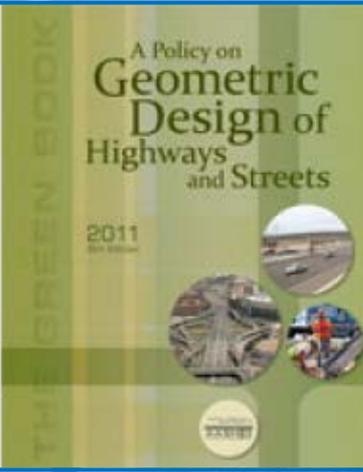
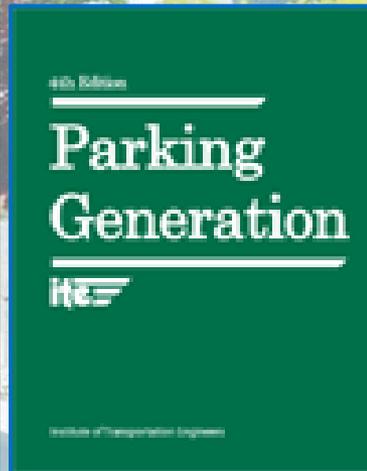
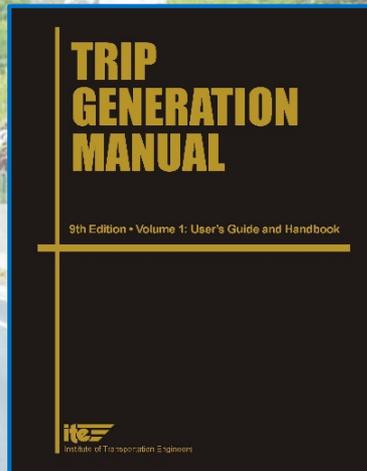
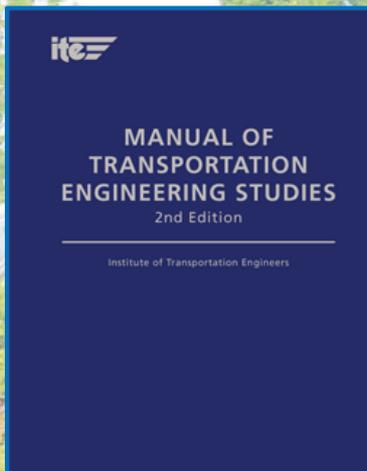
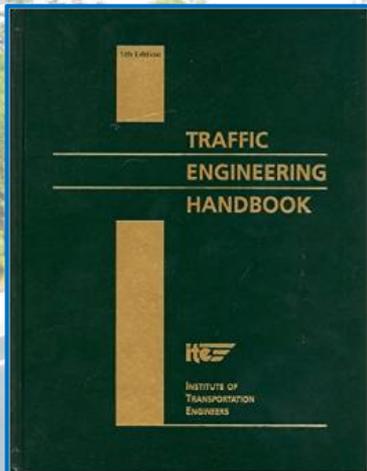
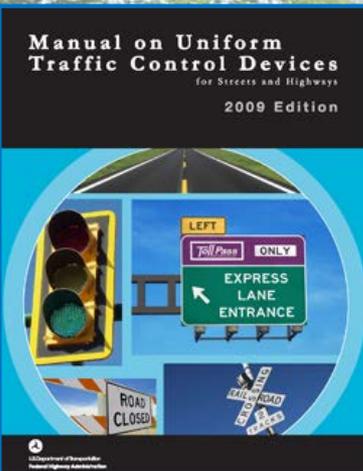
### Traffic Operations & Safety | Duty

- Operation of a complex Transportation System
  - Vehicle and Pedestrian/Bicycle Safety.
  - Responding to safety concerns trump all other activities.
- Users
- Case Law:
  - “Cities are obligated to exercise ordinary care to maintain its infrastructure in a reasonably safe condition for persons using them in a proper manner and exercising due care for their own safety.”*
- How?
  - Engineering Analysis
  - Performance Evaluation (Is the infrastructure operating as it was designed)
  - Data gathering

# Transportation & Engineering Services

## Primary Function & Responsibility

Traffic Operations & Safety | Authoritative Documents – Standards and Guidelines



# Transportation & Engineering Services

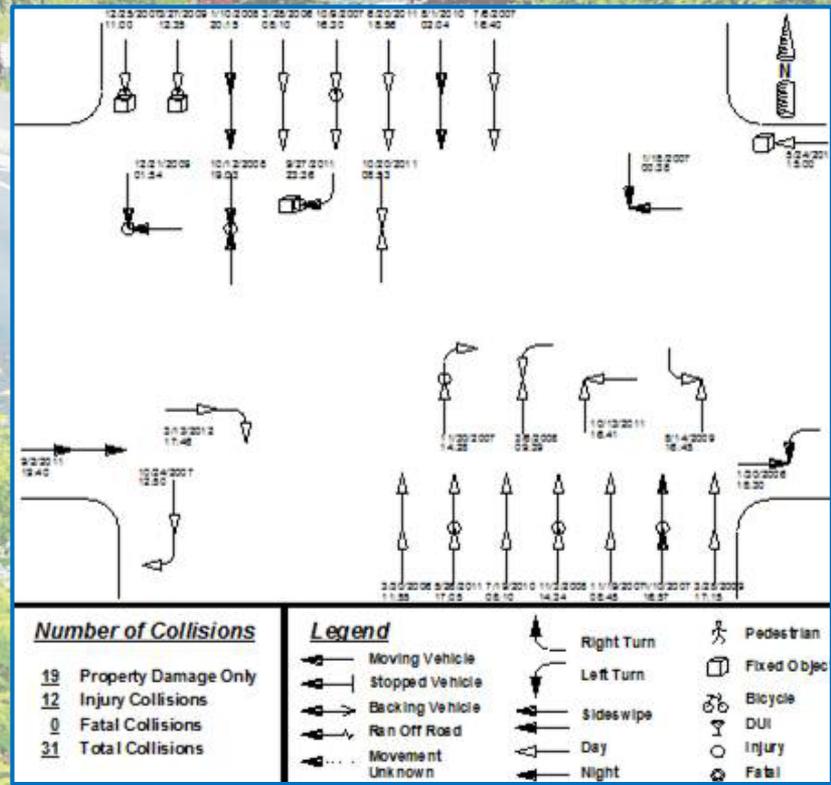
## Primary Function & Responsibility

Traffic Operations & Safety | Traffic Engineering



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Traffic Counts



Collision Analysis

# Transportation & Engineering Services

## Primary Function & Responsibility

Traffic Operations & Safety | Traffic Engineering



# Transportation & Engineering Services

## Primary Function & Responsibility

### Traffic Operations & Safety | Traffic Engineering

- In the last 8 years .... 1,942 reported crashes.
  - 1,393 Property Damage Only
  - 545 Injury
  - 4 Fatal



# Transportation & Engineering Services

## Primary Function & Responsibility

### Traffic Operations & Safety | Infrastructure Management

- **Direct and Manage Operations & Maintenance Activities**
- **Asset Management and Inspections**
  - *Infrastructure & assets are an investment. They must be maintained and accounted for.*
  - Infrastructure & Assets
  - 105 Miles of Street (215 lane miles)
  - 75 miles of striping and RPM's
  - 4,097 traffic signs
  - 1,421 pavement markings
  - 20 Traffic signals
  - 17 Electronic Traffic Control Devices (RRFB's, Driver Feedback Signs, etc.)
  - 1,705 PSE owned Street Lights & 77 City owned Street Lights
- **Traffic Control Devices – Authority of the Traffic Engineer**
  - Federal and State law guides the installation and management of traffic control devices.

# Transportation & Engineering Services

## Primary Function & Responsibility

Traffic Operations & Safety | Infrastructure Management



# Transportation & Engineering Services

## Primary Function & Responsibility

Traffic Operations & Safety | Infrastructure Management

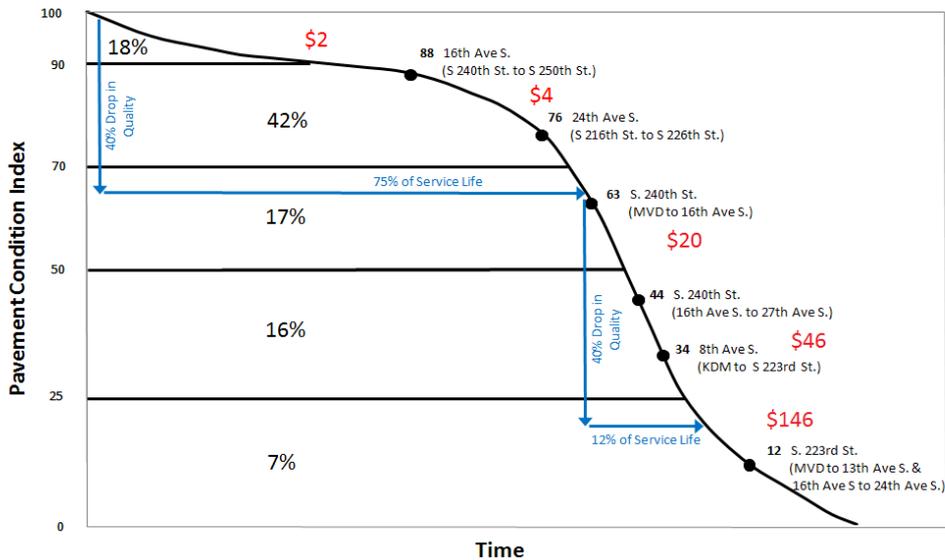


# Transportation & Engineering Services

## Primary Function & Responsibility

Traffic Operations & Safety | Infrastructure Management

City of Des Moines Pavement Condition by Area Over Time



# Transportation & Engineering Services

## Primary Function & Responsibility

Traffic Operations & Safety | Infrastructure Management



# Transportation & Engineering Services

## Primary Function & Responsibility

Traffic Operations & Safety | Infrastructure Management



# Transportation & Engineering Services

## Primary Function & Responsibility

Traffic Operations & Safety | Infrastructure Management



# Transportation & Engineering Services

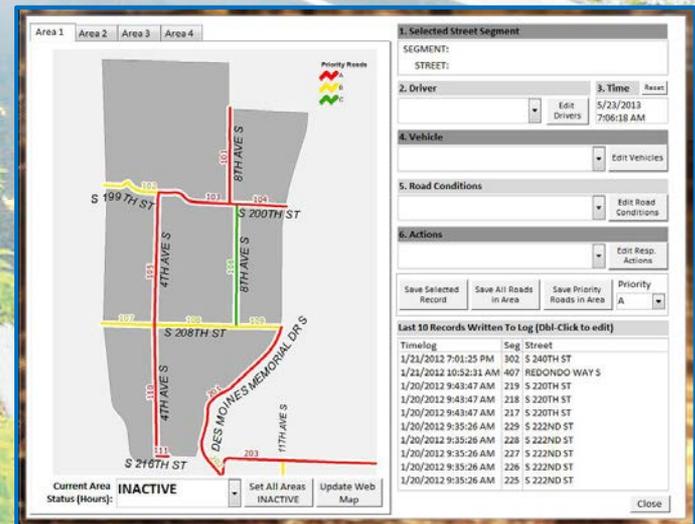
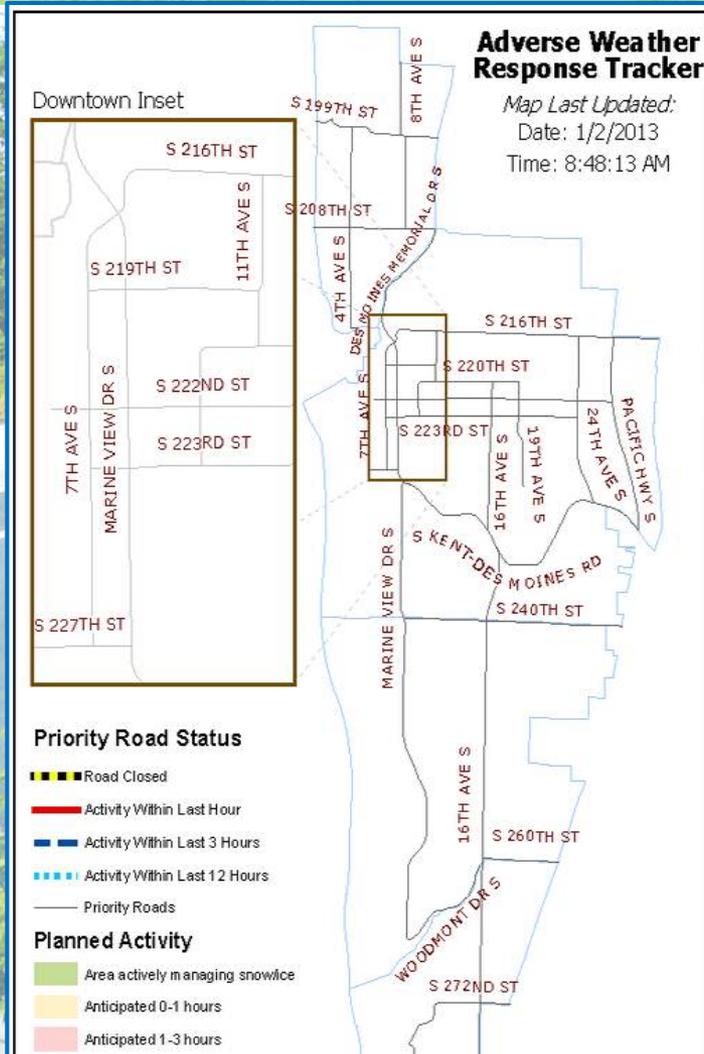
## Primary Function & Responsibility

Traffic Operations & Safety | Emergency Management



# Transportation & Engineering Services

## Primary Function & Responsibility Traffic Operations & Safety



# Transportation & Engineering Services

## Primary Function & Responsibility

### Liability & Risk Management | WCIA

- **Claims & Law Suits** – charged with vigorously defending the best interests of the citizens of the City in all aspects of civil engineering and infrastructure design, construction, and maintenance.
- **It's y(our) Money** – minimizing risk exposure helps protect citizen and community investments and resources.



# Transportation & Engineering Services

## Primary Function & Responsibility

### Liability & Risk Management

	Claim Loss History						
	2010	2011	2012	2013	2014	2015	
Community Development				\$2,287		\$10,000	
Engineering Services		\$315	\$4,033				
Public Works & Parks			\$516	\$6,200			
<b>Totals:</b>	<b>\$0</b>	<b>\$315</b>	<b>\$4,549</b>	<b>\$8,487</b>	<b>\$0</b>	<b>\$10,000</b>	<b>\$23,351</b>



# Transportation & Engineering Services

## Secondary Functions

- **Capital Improvements** – Building and maintaining infrastructure ( roadways, sidewalks, bikelanes, trails)
  - *Prioritization of capital improvements – needs are extensive, however resources are limited, prioritization of capital improvements is necessary. This prioritization is done through the development of the Comprehensive Transportation Plan, the 20-year Transportation Plan, and the 6-year Capital Improvement Plan.*
  - *Priority arrays – Guardrail needs/Sidewalk needs/Pavement Overlay needs*
- **Development Review** – Responsible for reviewing transportation impact of new development. Impacts include traffic, new infrastructure, access, etc..
- **Special Events**



# Transportation & Engineering Services

## Secondary Functions

### Capital Improvement Projects



# Transportation & Engineering Services

## Secondary Functions

### Development Services



Review of commercial and residential projects

# Transportation & Engineering Services

## Secondary Functions Development Services

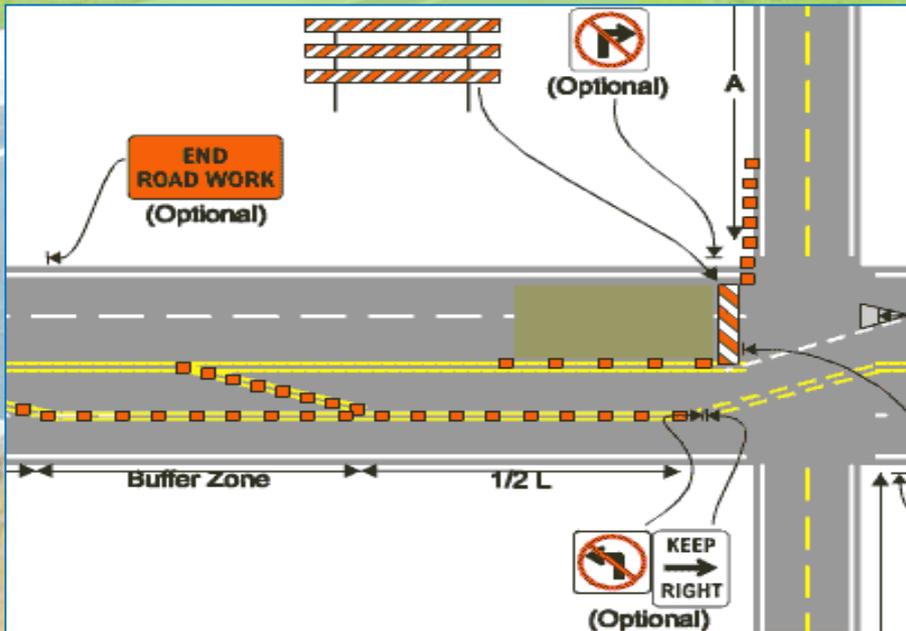


# Transportation & Engineering Services

## Secondary Functions

### Special Events

- **City Sponsored Events**
  - *4<sup>th</sup> of July*
  - *Waterland Parade*
  - *Redondo Bonfire/Christmas ship*
- **Private Events**
  - *Special Event Permit Applications*



# Transportation & Engineering Services

## Coordination - Utilities



**PUGET  
SOUND  
ENERGY**

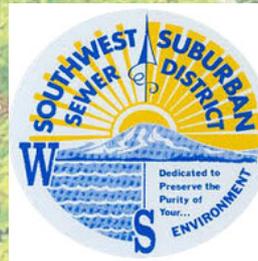
**KING COUNTY, WA  
WATER DISTRICT 54**



**Lakehaven**  
UTILITY DISTRICT  
Providing water and sewer services  
to communities in South King County.



**MIDWAY**  
Sewer District



# Transportation & Engineering Services

## Coordination - Utilities



# Transportation & Engineering Services

## Coordination - Agencies



U.S. Department of Transportation  
**Federal Highway Administration**



**King County**



**FEMA**

Port of   
of Seattle



**US Army Corps  
of Engineers®**



King County  
**METRO**



# Transportation & Engineering Services

## Coordination - Schools



# Transportation & Engineering Services

## Coordination - Transit



# Transportation & Engineering Services

## Coordination - Organizations

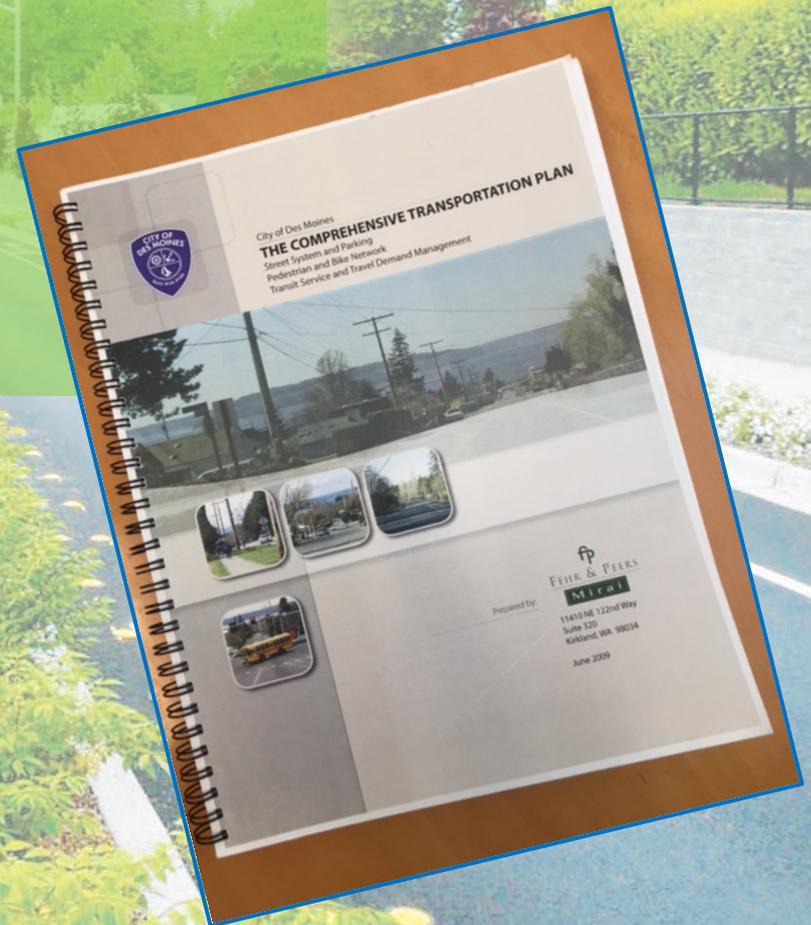
- **Professional Organizations**
  - *ITE*
  - *APWA*
  - *ASCE*
- **Regional MPO's & Committees**
  - *PSRC*
  - *RPEC*
  - *KCPEC*
  - *TPB*
  - *SCAT Board (TAC)*
  - *SKC PW Directors*
  - *KC PW Directors*
  - *ACE*
- **State Committees & Organizations**
  - *AWC*
  - *MRSC*



# Transportation & Engineering Services

## Planning

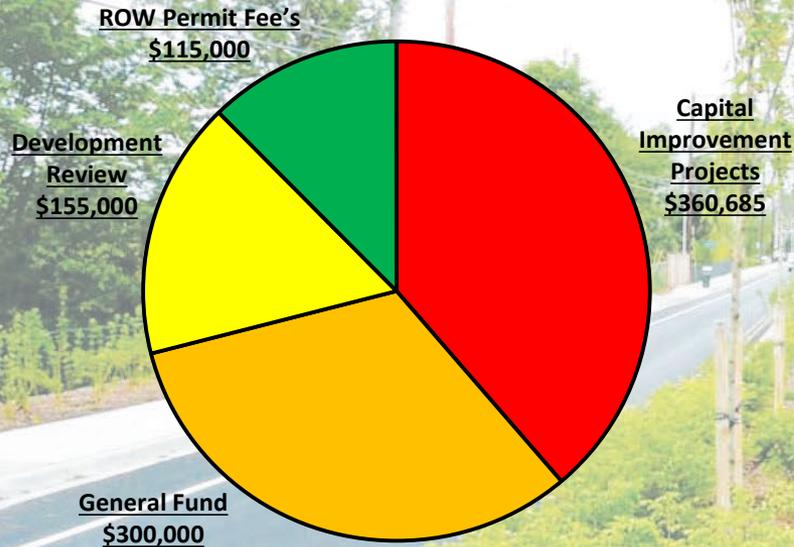
- **Comprehensive Transportation Plan (CTP)**
  - *Transportation Element*
  - *Transportation Impact Fee's*
- **Transportation Improvement Plan (TIP)**
- **6-year Capital Improvement Plan**
- **Title 12 DMMC**
- **Street Design & Construction Standards**



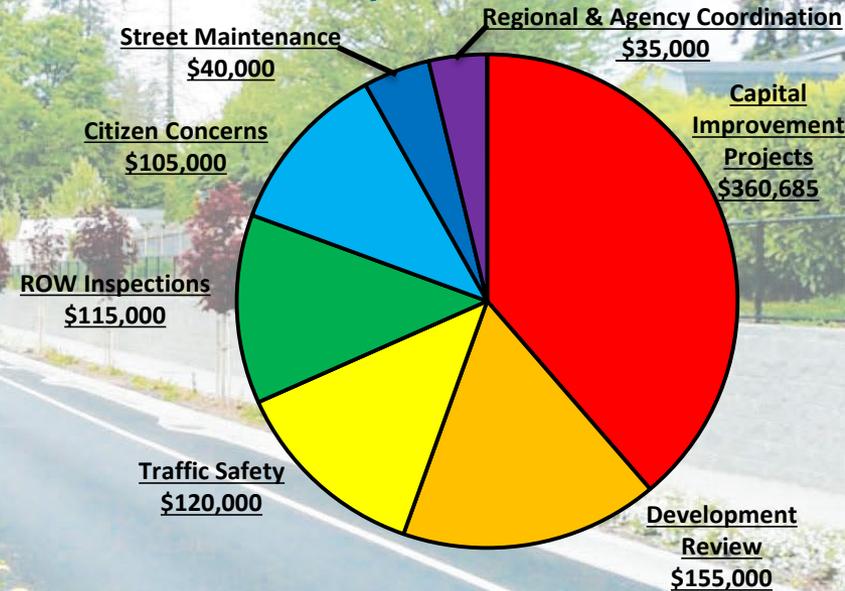
# Transportation & Engineering Services

## Personnel and Budget

### Revenue



### Expenditures



**Budget = \$930,685**

- 5 FTE's
- Transportation and Engineering Services Manager
- Associate Transportation Engineer
- Civil Engineer II
- Civil Engineer I
- Right-of-Way Inspector



# Surface Water & Environmental Engineering

## Overview

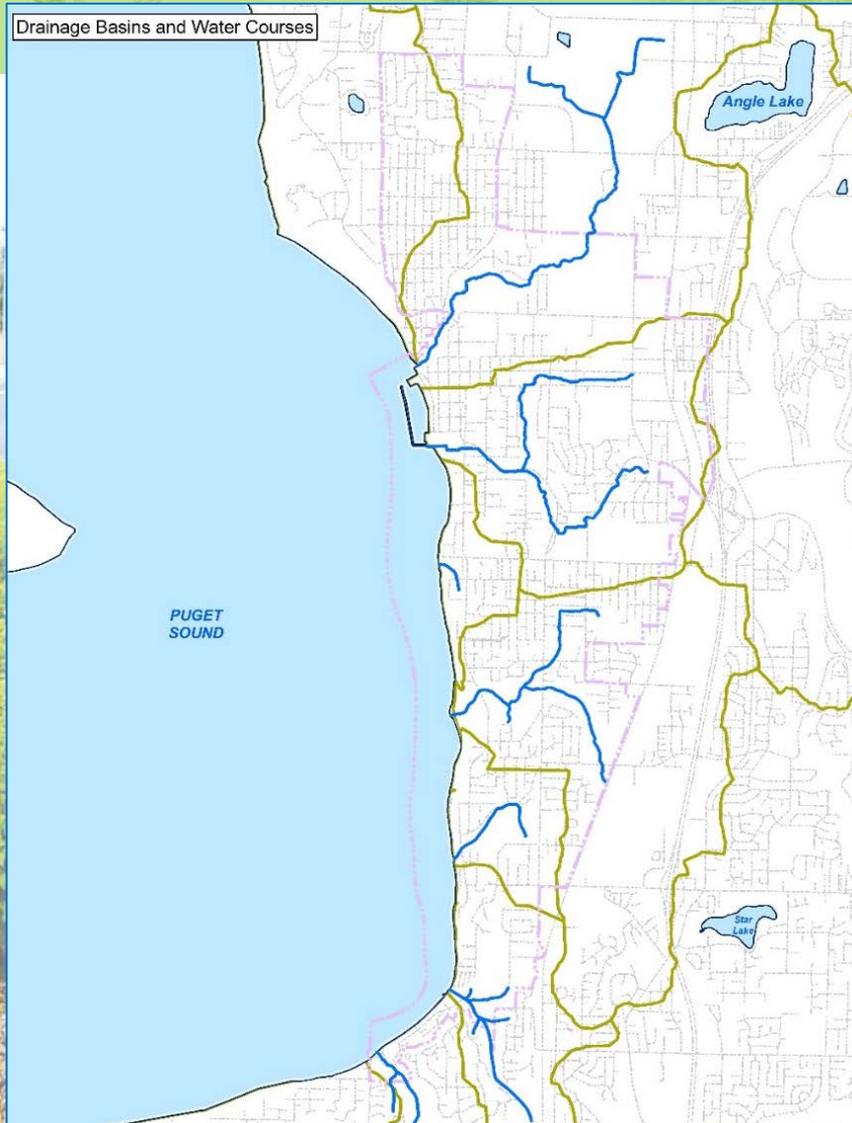
- **Primary Function and Responsibility**
  - *Protecting the Environment*
  - *NPDES Permit*
  - *Control Surface Water Runoff from Impervious Surfaces*
  - *Surface Water Detention and Treatment*
  - *Control and Manage Flooding*
  - *Infrastructure Management*
- **Secondary Functions**
  - *Capital Improvement Projects*
  - *Development Services*
- **Coordination**
- **Planning**



# Surface Water & Environmental Engineering

## Primary Function & Responsibility

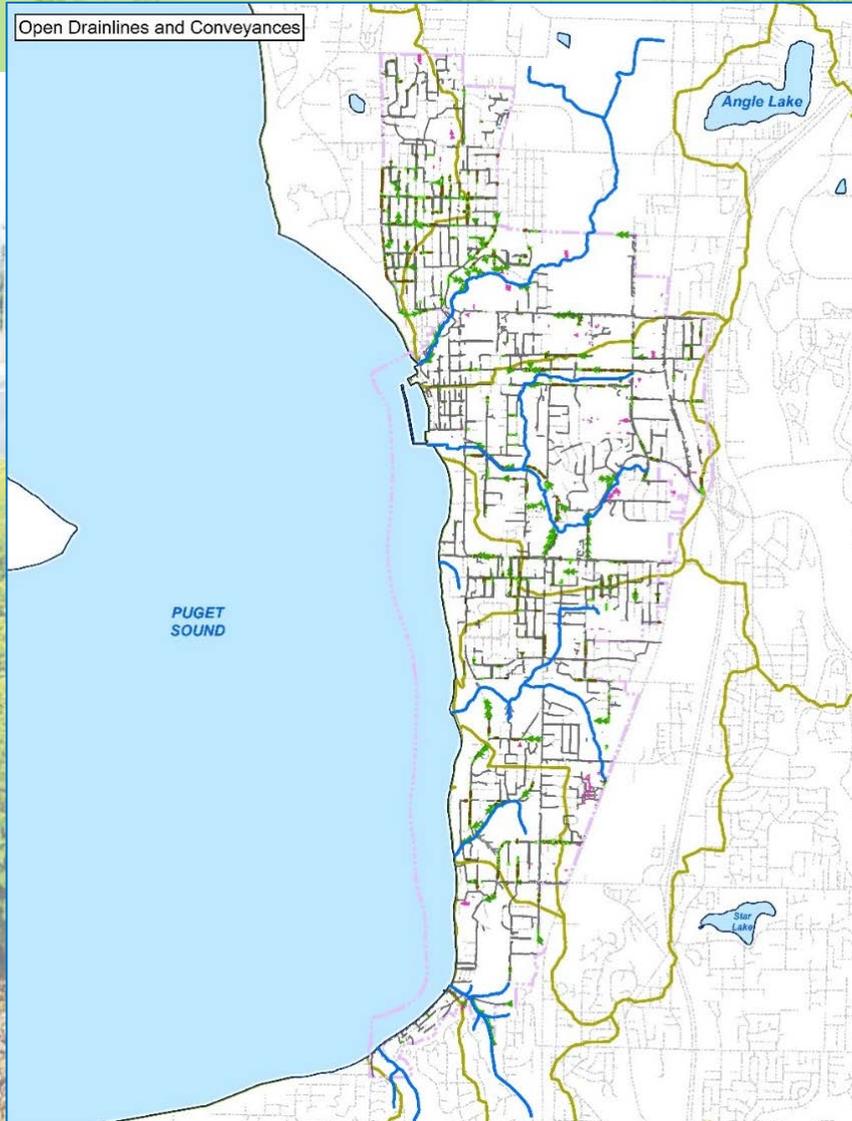
### Protecting the Environment



# Surface Water & Environmental Engineering

## Primary Function & Responsibility

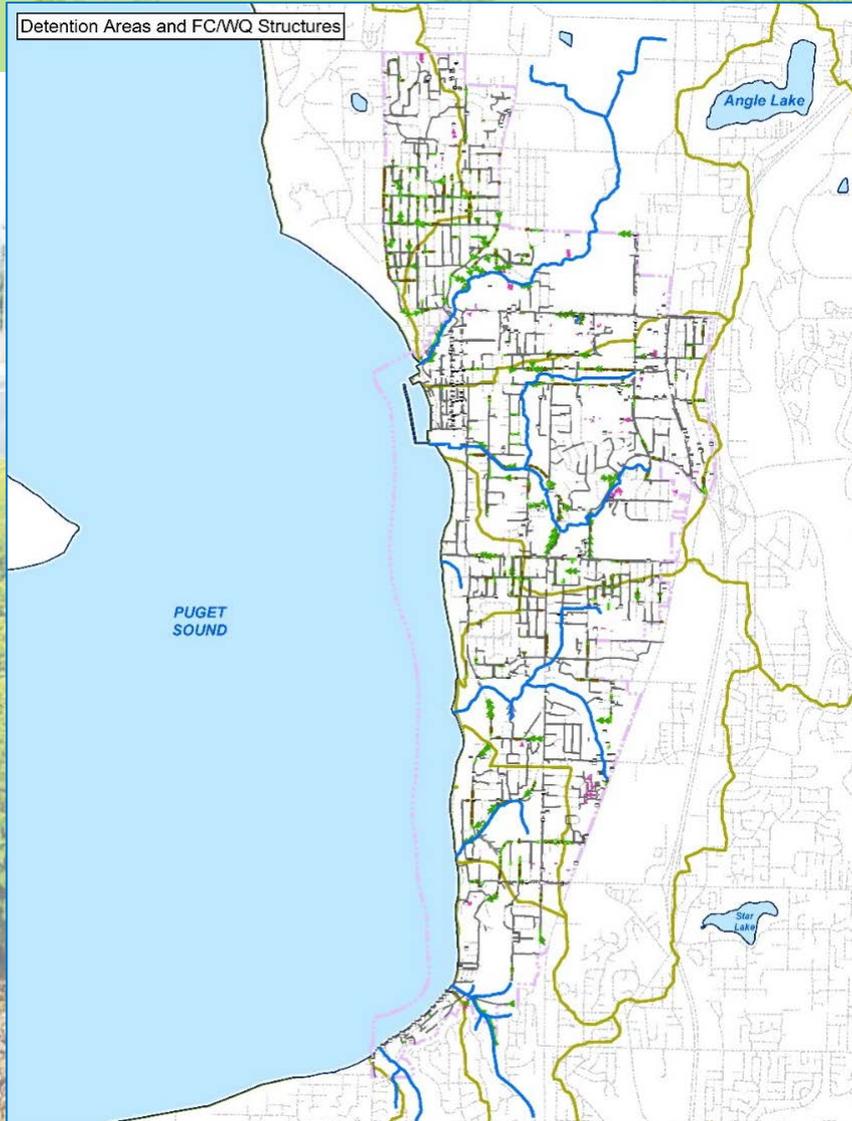
### Protecting the Environment



# Surface Water & Environmental Engineering

## Primary Function & Responsibility

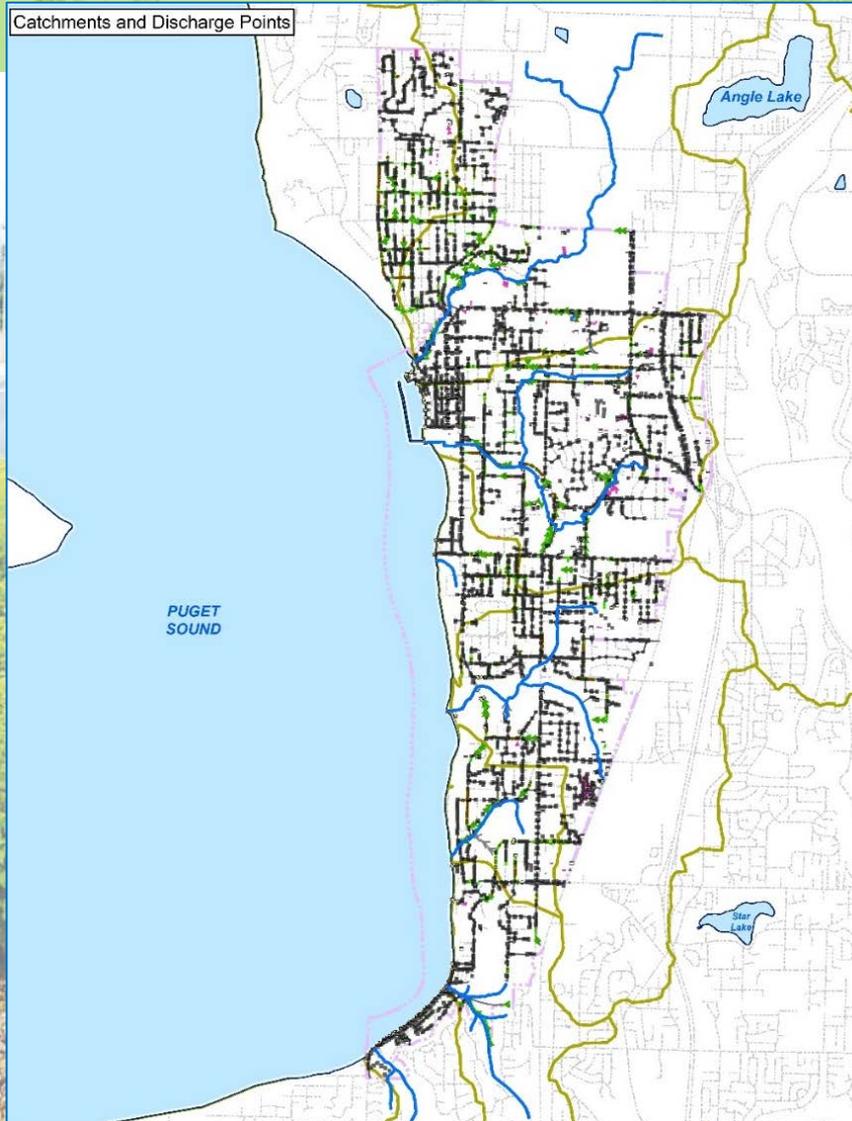
### Protecting the Environment



# Surface Water & Environmental Engineering

## Primary Function & Responsibility

### Protecting the Environment



# Surface Water & Environmental Engineering

## Primary Function & Responsibility

### Protecting the Environment



# Surface Water & Environmental Engineering

## Primary Function & Responsibility

Protecting the Environment



# Surface Water & Environmental Engineering

## Primary Function & Responsibility

### Protecting the Environment



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# Surface Water & Environmental Engineering

## Primary Function & Responsibility Protecting the Environment



# Surface Water & Environmental Engineering

## Primary Function & Responsibility

Protecting the Environment



# Surface Water & Environmental Engineering

## Primary Function & Responsibility

Protecting the Environment



# Surface Water & Environmental Engineering

## Primary Function & Responsibility

### NPDES Permit

#### Five Permit Components used to reduce pollution

- **Component #1 - Public Education and Outreach**
  - *Public Involvement and Participation*
  - *Illicit Discharge Detection and Elimination*
  - *Controlling Runoff from Development and Construction*
  - *Municipal Operations and Maintenance*
- **Component #2 – Volunteer cleanup events, Car Wash Kit program, Storm drain marker program**
- **Component #3 – Mapping the City’s stormwater infrastructure and tracking down sources of pollution**
- **Component #4 – Upcoming Development L.I.D. Standards**
- **Component #5 - Catch basin vactoring, facility maintenance and cleaning, street sweeping**

# Surface Water & Environmental Engineering

## Primary Function & Responsibility

### Control Surface Water Runoff



# Surface Water & Environmental Engineering

## Primary Function & Responsibility

### Surface Water Detention



# Surface Water & Environmental Engineering

## Primary Function & Responsibility

### Surface Water Treatment



# Surface Water & Environmental Engineering

## Primary Function & Responsibility

Control and Manage Flooding



# Surface Water & Environmental Engineering

## Primary Function & Responsibility

### Infrastructure Management

- Oversight of Operations and Maintenance
- 4,832 Catch Basins / 60 Manholes
- 85 miles of Storm pipe
- 19 miles of ditches
- 16 Detention Ponds
- 46 Detention Vaults
- 32 Treatment Facilities



# Surface Water & Environmental Engineering

## Secondary Functions Capital Improvement Project



# Surface Water & Environmental Engineering

## Secondary Functions Development Services



**KING COUNTY, WASHINGTON  
SURFACE WATER  
DESIGN MANUAL**



# Surface Water & Environmental Engineering

## Coordination - Agencies



US Army Corps  
of Engineers®



KING COUNTY  
FLOOD CONTROL  
DISTRICT



Washington  
Department of  
**FISH and  
WILDLIFE**



WRIA 9



**FEMA**

# Surface Water & Environmental Engineering

## Planning

- **Surface Water Comprehensive Plan**
  - *SWM Rates*
- **6-year Capital Improvement Plan**
- **Title 11 DMMC**
- **Low Impact Development Standards**

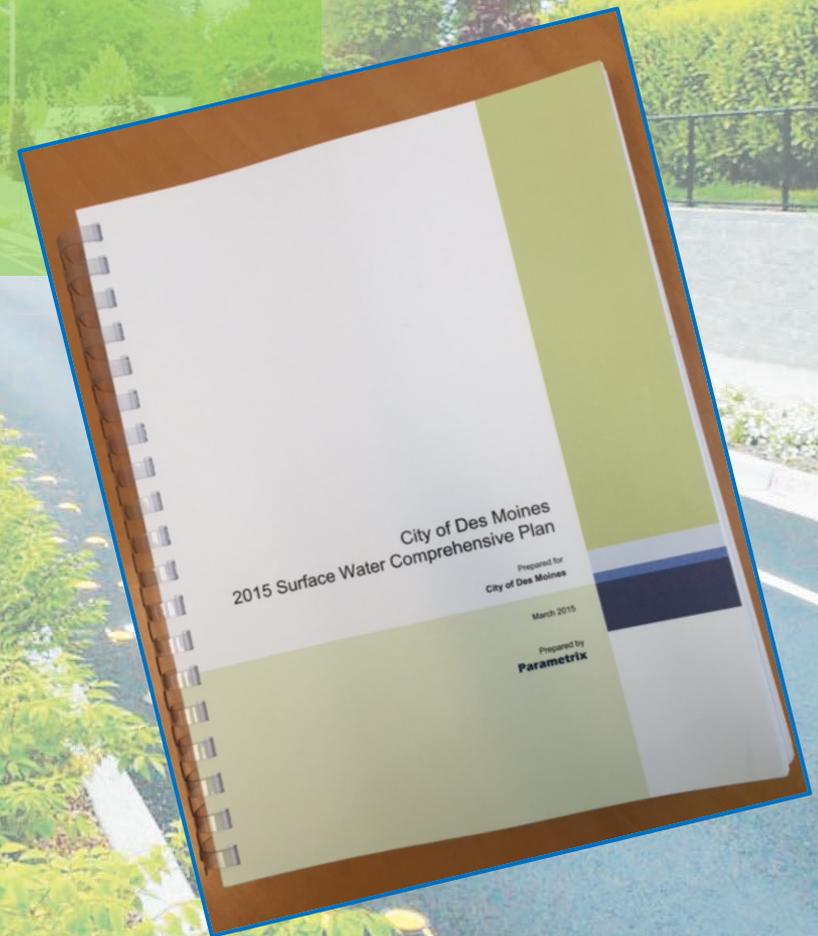
STORMWATER POLLUTION PREVENTION FACT SHEET

**Clean Water is Everyone's Business**

Puget Sound  
Starts Here

**Low Impact  
Development (LID)**

*Coming to a Neighborhood Near You*



# Surface Water & Environmental Engineering

## Common Misunderstandings

- **Private Property & Surface Water**
- **The City does not manage surface water on private properties**  
(the City does review private development to ensure that development standards are being met).
- **Resident crawl space issues are usually related to persistent groundwater problems that are exacerbated by plugged foundation drains, cracks in the foundation, or surface draining downspouts.**



# Surface Water & Environmental Engineering

## Common Misunderstandings

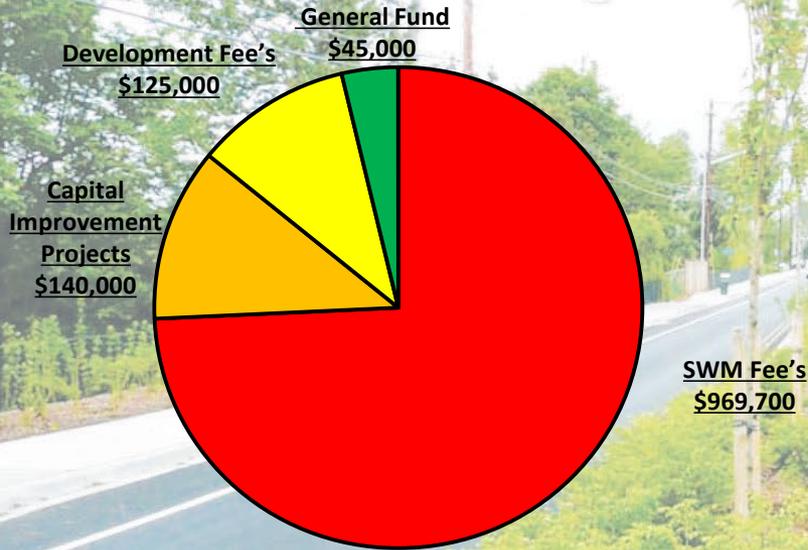
- The City does not generally involve itself with surface water impacts/disputes between property owners but only when there is a potential City code violation.
- A City or public drainage easement does not imply ownership of the property, but allows the City to maintain the public infrastructure (usually catch basins, pipes and ditches) as specified in the easement provisions.
- The City does not conduct maintenance or construction activities on private property.



# Surface Water & Environmental Engineering

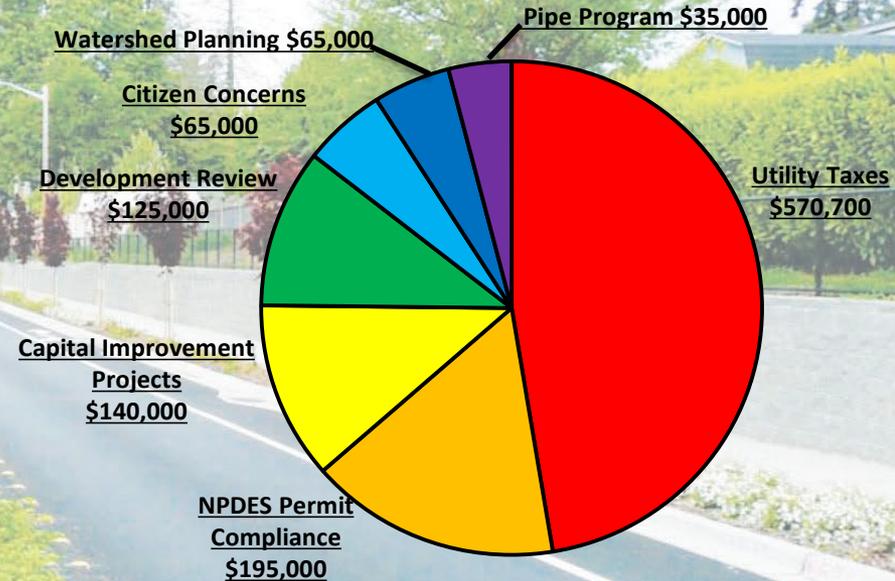
## Personnel and Budget

### Revenue



**Budget = \$1,204,700**

### Expenditures



- 5.0 FTE's:
- Utility Manager
- Civil Engineer I
- 2 Engineering Techs
- Engineering Aide



# Capital Improvement Program

## Capital Improvement Projects

- **Transportation Projects**
  - *Roadways*
  - *Pedestrian and Bicycle Facilities*
  - *Traffic Signals and Traffic Control Devices,*
  - *Trails*
  - *Safety Projects*
- **SWM Projects**
  - *Flood control*
  - *Culvert Replacements*
  - *Pond and Vaults*
- **Municipal Capital Improvements (MCI)**
  - *Large Scale Facility Repairs*
  - *Parks & playgrounds*
- **Facility Repair & Replacement (Fund 506)**
  - *Planned facility repairs*



# Capital Improvement Program

## Capital Improvement Projects

- **Project Phases**
  - *Planning and Development*
  - *Preliminary Design & Engineering*
  - *Right-of-Way Acquisition*
  - *Final Design & Engineering*
  - *Contract Procurement & Bidding*
  - *Construction*
  - *(Management and Inspection)*
- **In-House Resources**
- **Consultant Support**

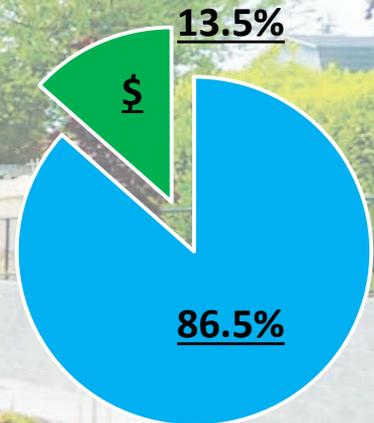


# Capital Improvement Program

## Funding

### Federal Grants

- **FHWA (Federal Highway Administration)** – funded Boardwalk repairs
- **FEMA (Federal Emergency Management Agency)** – funded landslides (DMMD, MVD)
- **STP (Surface Transportation Program)** – funded 24<sup>th</sup> Ave South
- **CMAQ (Congestion Mitigation and Air Quality)** – funded Barnes Creek Trail design
- **SRTS (Safe Routes to School)** – funded South 268<sup>th</sup> Street improvements
- **BRAC (Bridge Replacement Advisory Committee)** – funded retrofit of North Twin Bridge and Saltwater State Bridge
- **CDBG (Community Development Block Grants)**



# Capital Improvement Program

## Funding

Federal Grants – The Deck is Stacked.....



**City of Seattle**



**King County**

# Capital Improvement Program

## Funding

### State Grants

- **HSIP (Highway Safety Improvement Program)**
- **SRTS (Safe Routes to School)**
- **PED/BIKE**
- **TIB (Transportation Improvement Board) – funded 16<sup>th</sup> Ave S, 216<sup>th</sup> Seg. 2, 216<sup>th</sup> Seg 1a, Boardwalk repairs**
- **FMSIB (Freight Mobility Strategic Investment Board) – funded 216<sup>th</sup> Seg 1a**
- **LEGISLATIVE APPROPRIATIONS – funded Boardwalk repairs**
- **State grants also require matches, in some cases, such as TIB (Transportation Improvement Board) the local match is between 40-60%.**
- **All grants (whether State or Federal) are highly competitive and staff must submit projects and prepare applications that highlight the potential investment. Statewide and within the Puget Sound region, there is far more infrastructure need than available resources.**

# Capital Improvement Program

## Funding

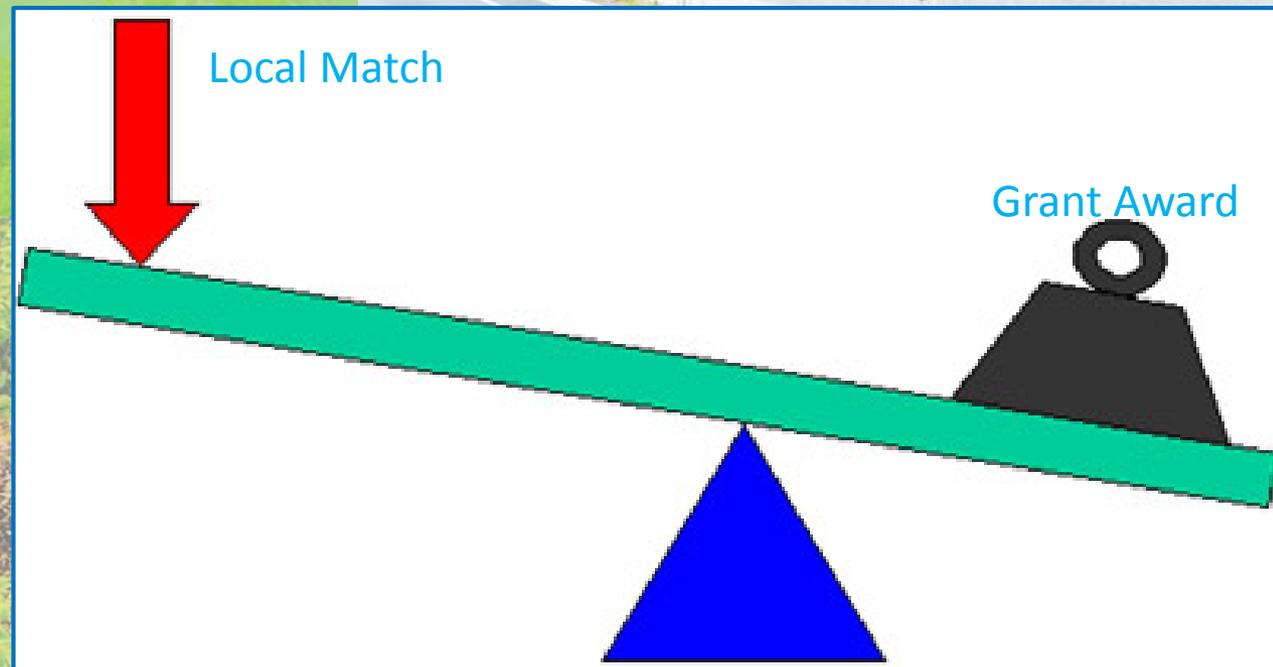
### Local

- **Sources for Local Match Requirements**

- *Traffic Impact Fees*
- *In-Lieu Fees*
- *Fuel Tax*
- *Transportation Benefit District*
- *REET 1*
- *REET 2*

- **Leverage**

- **Gateway = \$20 M**



# Capital Improvement Program

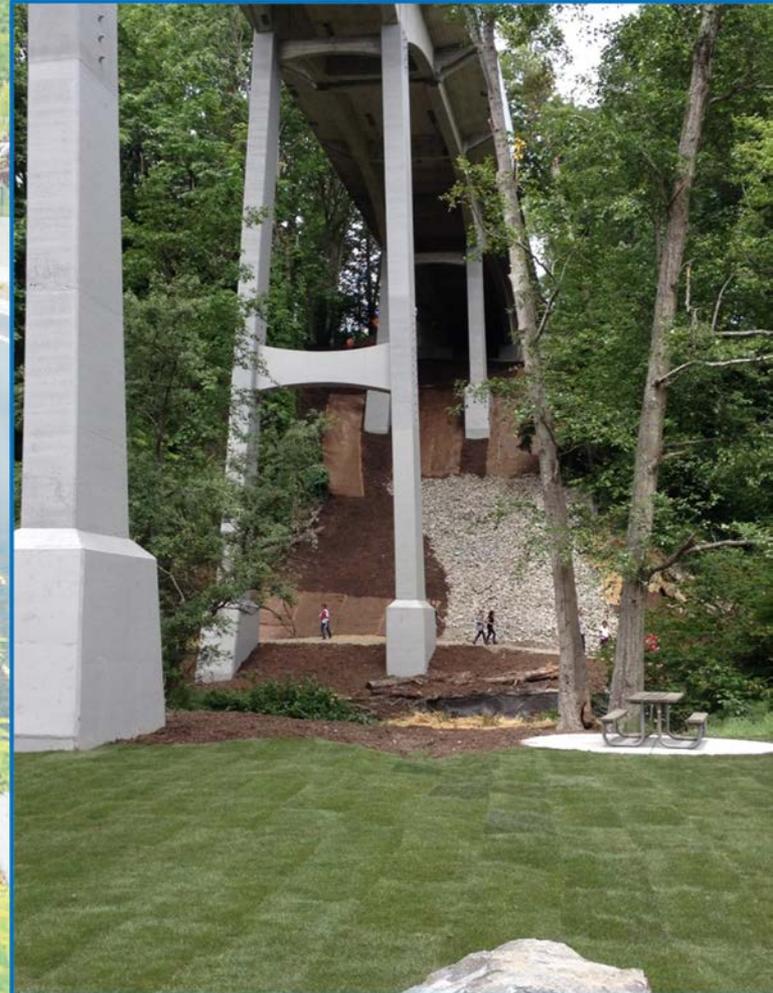
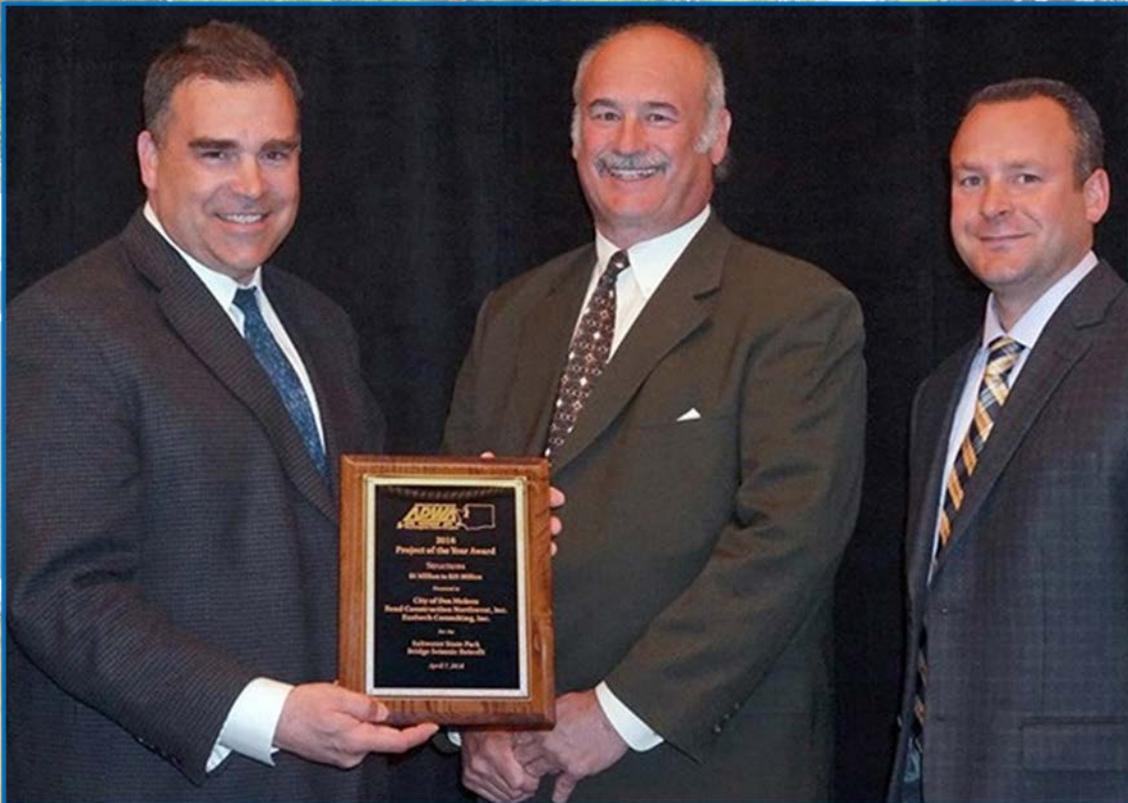
## Funding

### CA Authority

- All Federal and State Projects are Administered by the Washington State Department of Transportation's Highways and Local Programs Division
- Local Agencies granted "CA authority" *save time and money*, since the agency has the authority to develop, advertise, award and manage its own projects.
- CA Requirements
- Projects must be administered in accordance with the LAG manual.
- Projects must be administered by a Licensed Professional Civil Engineer registered in Washington State, who is either on the staff as a public employee, or is a contract employee designated as the agency's Engineer.
- The agency shall have sufficient expertise and capability to perform and supervise design, PS&E, and construction administration phases.
- The local agency must have designated official approving authority for all WSDOT delegated project approvals

# Capital Improvement Program

## Successful Projects APWA Project of the Year



# Capital Improvement Program

## Successful Projects

### Transportation Gateway Project



# Capital Improvement Program

## Successful Projects

### Pacific Highway South



# Capital Improvement Program

## Successful Projects

### Redondo Boardwalk Project



# Capital Improvement Program

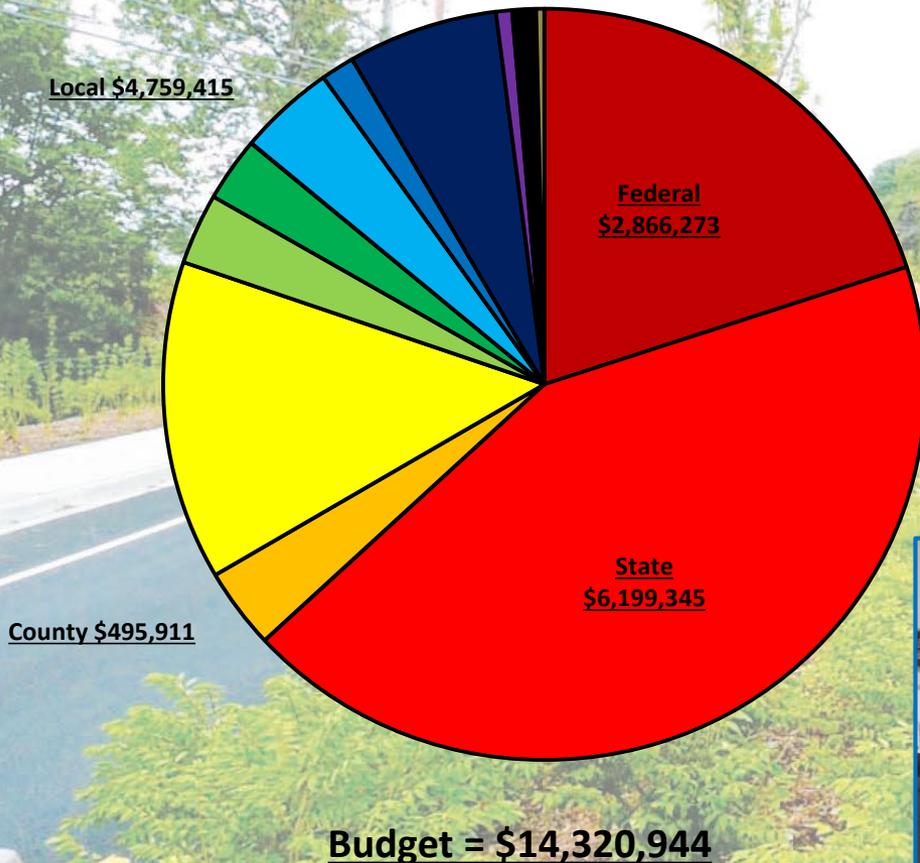
## 2016 CIP Projects

- **MCI Projects**
  - *Field House Tennis Court Resurface*
  - *DMBP Picnic Shelter*
  - *Parkside Playground & Soil Remediation*
- **Facility Repair Projects (Fund 506)**
  - *Council Chambers Lighting*
  - *Field House Roof Replacement*
- **Transportation Projects**
  - *Saltwater Bridge Seismic Retrofit*
  - *South 216<sup>th</sup> Street – Segment 1A*
  - *24<sup>th</sup> Ave. South - Gateway*
  - *South 224<sup>th</sup> Street – Pacific Ridge*
  - *Barnes Creek Trail*
  - *Midway Elementary SRTS*
  - *Traffic Calming*
  - *South 268<sup>th</sup> Street Sidewalk Project*
  - *Redondo Boardwalk*
- **SWM Projects**
  - *Barnes Creek Culvert*
  - *Lower Massey Creek*
  - *South 251<sup>st</sup> Street Outfall*



# Capital Improvement Program

## Personnel and Budget



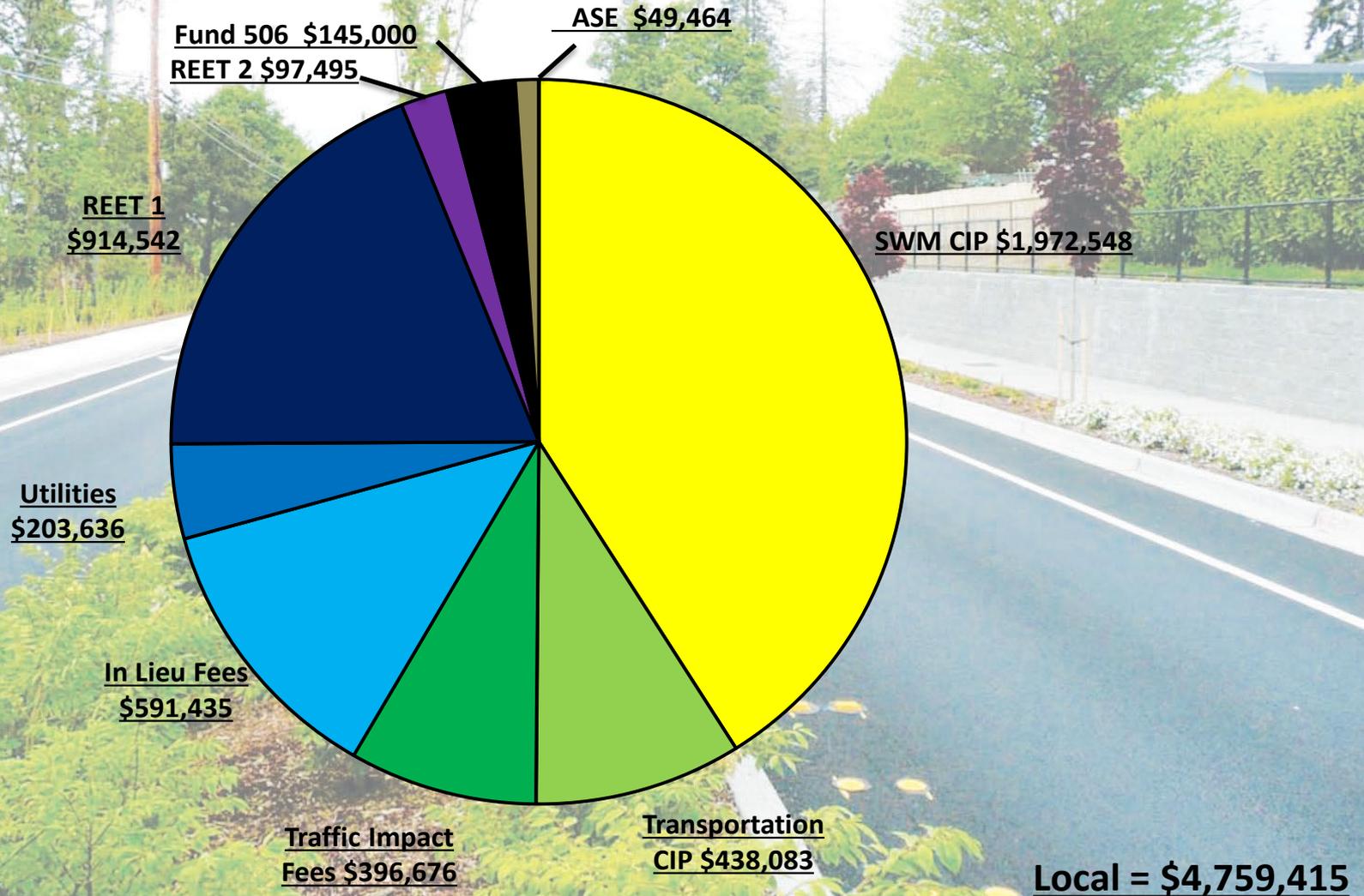
- **Federal, State & County Grants = 66.77%**
  - \$9,561,529
  - \$4,759,415 Local
- **100% of the CIP Budget is restricted**

- **1.0 FTE**
- **“In-House” Staff Support**



# Capital Improvement Program

## Local CIP Funding



# City Government 101

## Engineering Services

- ✓ Part 9a: Community Development
- ✓ Part 9b: Engineering Services
- Part 9c: Public Works & Parks Maintenance

