

Cost of Infrastructure

Ian Thomas: June, 2019









Cost of Constructing and Operating Public Infrastructure Systems

Two Independent Cost Components Need to be Recovered:

1. One-time capital construction cost to add capacity:
 - Proportional to number/size of homes built
 - Efficiently and fairly recovered with one-time fee on new development
2. Ongoing operations, maintenance, and service delivery costs:
 - Proportional to quantity/usage of service
 - Efficiently and fairly recovered by combining with ongoing per unit of consumption cost of service delivery

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One-Time Capital Constructing Cost of Adding Capacity to the Electrical System

FY 2015 – 18 Capital Projects (Electric Utility):

- Transmission/distribution system expansion: ***\$26 million***
- Annual cost of system expansion for growth: ***\$6.5 million***
- Number of current customer accounts: ***50,000***
- Cost per current customer: ***\$130/year***

Each current customer is paying a subsidy of > \$10/month



Strategic Plan 2016 – 2019

Focus on Social Equity

Columbia, a Tale of Two Cities

We did not experience the type of suffering that some cities endured during the last recession.

There is ... another story running beneath the economic recovery - we're also seeing increased poverty, decreased per capita income, ... This imbalance is one of the greatest challenges we face in Columbia, our nation and across the globe.

We prefer a community where everyone ... can thrive. We can't ignore this gap as long as there's something we can do to open economic and social opportunities, ...



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From FY05 to FY14:

*How Much did Columbia Spend to
Increase Road System Capacity?*

\$84.5 million

*How Much did Columbia Collect in
Development Fees for New/Expanded Roads?*

\$9.3 million

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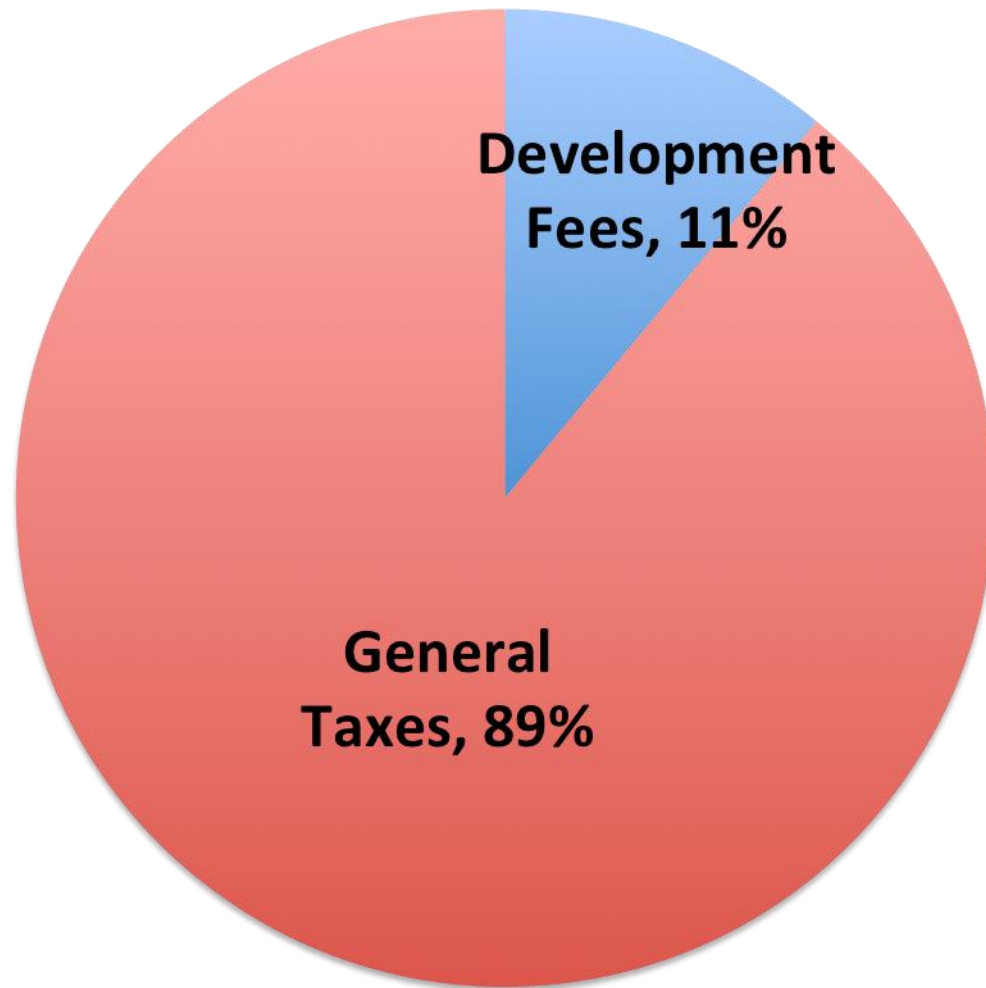
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Private versus Public Contributions to Road System Expansion (FY05 – FY14)



From FY05 to FY14:

Collections in Development Fees versus Infrastructure System Expansion Costs

	<u>Dev. Fees</u>	<u>Total Cost</u>	<u>Recovery</u>
• Road system:	\$ 9.3 m	\$ 84.5 m	11.0 %
• Sewer system:	\$ 6.5 m	\$ 24.4 m	26.6 %
• Storm water system:	\$ 3.4 m	\$ 5.2 m	65.4 %
• Water system:	\$ 7.0 m	\$ 18.0 m	38.9 %
• Electric system:	\$ 0.0	\$ 19.8 m	0.0 %
AGGREGATES:	\$ 26.2 m	\$ 151.9 m	17.2 %

Population increase ~ 20,000, total number of new homes ~ 8,000

One-time capital construction cost

Cost Per Average Home Built (more formal studies)

	<u>Austin, TX, 2011</u>	<u>Bloomington, IN, 2008</u>
• Road system:	\$ 3,000	\$ 4,000
• Sewer system:	\$ 3,000	
• Storm water system:	\$ 3,000	
• Drinking water system:	\$ 3,000	\$ 1,000
• Electricity system:		
• Public safety system:		\$ 1,000
• Parks system:	\$ 2,000	\$ 3,000
• School system:	\$ 9,000	\$ 6,000
 COST OF SYSTEMS STUDIED:	 \$23,000	 \$15,000

Assume typical figure of \$30,000/home = \$12,000/resident

	First 10,000 residents	Second 10,000 residents	Third 10,000 residents	Fourth 10,000 residents	Fifth 10,000 residents	Sixth 10,000 residents	Seventh 10,000 residents
Years 1 – 10	\$120 m						
TOTAL PAID	\$120 m	\$0	\$0	\$0	\$0	\$0	\$0

	First 10,000 residents	Second 10,000 residents	Third 10,000 residents	Fourth 10,000 residents	Fifth 10,000 residents	Sixth 10,000 residents	Seventh 10,000 residents
Years 1 – 10	\$120 m						
Years 11 – 20	\$60 m	\$60 m					
TOTAL PAID	\$180 m	\$60 m	\$0	\$0	\$0	\$0	\$0

	First 10,000 residents	Second 10,000 residents	Third 10,000 residents	Fourth 10,000 residents	Fifth 10,000 residents	Sixth 10,000 residents	Seventh 10,000 residents
Years 1 – 10	\$120 m						
Years 11 – 20	\$60 m	\$60 m					
Years 21 – 30	\$40 m	\$40 m	\$40 m				
TOTAL PAID	\$220 m	\$100 m	\$40 m	\$0	\$0	\$0	\$0

	First 10,000 residents	Second 10,000 residents	Third 10,000 residents	Fourth 10,000 residents	Fifth 10,000 residents	Sixth 10,000 residents	Seventh 10,000 residents
Years 1 – 10	\$120 m						
Years 11 – 20	\$60 m	\$60 m					
Years 21 – 30	\$40 m	\$40 m	\$40 m				
Years 31 – 40	\$30 m	\$30 m	\$30 m	\$30 m			
TOTAL PAID	\$250 m	\$130 m	\$70 m	\$30 m	\$0	\$0	\$0

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Years 1 – 10	\$120 m						
Years 11 – 20	\$60 m	\$60 m					
Years 21 – 30	\$40 m	\$40 m	\$40 m				
Years 31 – 40	\$30 m	\$30 m	\$30 m	\$30 m			
Years 41 – 50	\$24 m	\$24 m	\$24 m	\$24 m	\$24 m		
TOTAL PAID	\$274 m	\$154 m	\$94 m	\$54 m	\$24 m	\$0	\$0

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Years 21 – 30	\$40 m	\$40 m	\$40 m				
Years 31 – 40	\$30 m	\$30 m	\$30 m	\$30 m			
Years 41 – 50	\$24 m	\$24 m	\$24 m	\$24 m	\$24 m		
Years 51 – 60	\$20 m	\$20 m	\$20 m	\$20 m	\$20 m	\$20 m	
TOTAL PAID	\$294 m	\$174 m	\$114 m	\$74 m	\$44 m	\$20 m	\$0

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Years 31 – 40	\$30 m	\$30 m	\$30 m	\$30 m			
Years 41 – 50	\$24 m	\$24 m	\$24 m	\$24 m	\$24 m		
Years 51 – 60	\$20 m	\$20 m	\$20 m	\$20 m	\$20 m	\$20 m	
Years 61 – 70	\$17 m	\$17 m	\$17 m	\$17 m	\$17 m	\$17 m	\$17 m
TOTAL PAID	\$311 m	\$191 m	\$131 m	\$91 m	\$61 m	\$37 m	\$17 m

Next Steps

Growth Impact Study:

- *How much does it cost the City to expand infrastructure capacity for each new home?*

Possible Service Lines:

- *Electricity*
- *Arterial/Collector Roads*
- *Police and Fire*

Community Conversation:

- *How much do we value growth?*
- *How much subsidy do we want to provide?*

Policy Decision:

- *Establish appropriate development charges and impact fees*

Distribution of Bond Repayment Burden

Parameters:

- Project cost (school) = \$20,000,000
- Bond repayment timeframe = 20 years
- Current number of homes = 50,000
- Population growth = 1.5%/year

Repayment burden for new homes:

Total number of new homes = $0.015 * 50,000 * 20 = 15,000$

Burden proportional to ***average*** number of new homes = 7,500

Repayment burden for existing homes:

Burden proportional to number of existing homes = 50,000

New homes contribute 15% as much as existing homes contribute