

**SUDDEN VALLEY COMMUNITY ASSOCIATION**  
**ROADS**  
**RESERVE STUDY**  
**LEVEL I: FULL RESERVE STUDY FUNDING ANALYSIS**  
**2017**



**SUDDEN VALLEY COMMUNITY ASSOCIATION - ROADS**

**Executive Summary**

	<p><b><u>Year of Report:</u></b> January 1, 2017 to December 31, 2017</p> <p><b><u>Number of Units:</u></b> 3152 Units</p> <p><b><u>Parameters:</u></b> Beginning Balance: \$1,734,047</p> <p>Year 2017 Current Contribution: \$588,579</p>	
<p>Year 2017 Projected Interest Earned: \$610</p> <p>Inflation: 2.50%</p> <p>Annual Increase to Current Contribution: 0.00%</p> <p>Lowest Cash Balance Over 30 Years (Threshold): -\$41,859,282</p> <p>Average Reserve Assessment per Unit: \$15.56</p> <p><b>RCW 64.38.070 Section 4.2 Disclosures:</b></p> <p>(a) A reserve component list: Please see pages 7</p> <p>(b) Date of study: May 24, 2016</p> <p><b>This reserve study meets the requirements of RCW 64.38.070 section 4</b></p>		
<p>(c) Level I: Full Reserve Study Funding Analysis and Plan</p> <p>(d) Reserve account balance as of May 24, 2016: \$1,734,047</p> <p>(e) Percent funded as of 2017: 16%</p> <p>(f) Special assessments implemented or planned: Please see page 6</p> <p>(g) Interest rate: 0% Inflation rate: 2.50%</p> <p>(h) Current reserve account contribution rate: \$770,585</p> <p>(i) 2017 Recommended reserve contribution: \$588,579 2017 Fully funded contribution: 2,423,647 2017 Baseline contribution: 1,355,552</p> <p>(j) Projected account balance for thirty years: Please see page 6</p> <p>(k) This reserve study was prepared by a reserve study professional</p>		

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**Sudden Valley Community Association - Roads  
Category Detail Index**

Asset ID	Description	Replacement	Page
<b>Culverts</b>			
1226	Culvert Work 2017	2017	13 of 23
1234	Culvert Work 2018	2018	13 of 23
1235	Culvert Work 2019	2019	14 of 23
1236	Culvert Work 2020	2020	14 of 23
1237	Culvert Work 2021	2021	15 of 23
1238	Culvert Work 2022	2022	15 of 23
1239	Culvert Work 2023	2023	16 of 23
1240	Culvert Work 2024	2024	16 of 23
1241	Culvert Work 2025	2025	17 of 23
1242	Culvert Work 2026+	2026	17 of 23
1244	Culvert Work Annual	2017	18 of 23
<b>Roads</b>			
1225	Road Work	2017	19 of 23
	Total Funded Assets	12	
	Total Unfunded Assets	<u>0</u>	
	Total Assets	12	

**Sudden Valley Community Association - Roads**  
 Bellingham, Washington  
**Cash Flow Method - Current Funding Model Summary**

<b>Report Date</b>	<b>May 24, 2016</b>
<b>Account Number</b>	<b>2sudde</b>
<b>Budget Year Beginning</b>	<b>January 01, 2017</b>
<b>Budget Year Ending</b>	<b>December 31, 2017</b>
<b>Total Units</b>	<b>3152</b>

<i>Report Parameters</i>	
<b>Inflation</b>	<b>2.50%</b>
<b>Interest Rate on Reserve Deposit</b>	<b>0.10%</b>
<b>2017 Beginning Balance</b>	<b>\$1,734,047.00</b>

**Current Funding  
 Model Summary**

- This study utilizes the cash flow method and the threshold funding model, which establishes a reserve funding goal that keeps the reserve balance above a specified dollar or percent funded amount.
- The following items were not included in the analysis because they have useful lives greater than 30 years: grading/drainage; foundation/footings; storm drains; telephone, cable, and internet lines.
- This funding scenario begins with a contribution of **\$588,579** in **2017** and increases **0.00%** each year for the remaining years of the study. A minimum balance of **-\$41,859,282** is maintained.
- The purpose of this study is to insure that adequate replacement funds are available when components reach the end of their useful life. Components will be replaced as required, not necessarily in their expected replacement year. This analysis should be updated annually.

<i>Cash Flow Method - Threshold Funding Model Summary of Calculations</i>	
<b>Required monthly Contribution</b>	<b>\$49,048.25</b>
<i>\$15.56 per unit monthly</i>	
<b>Average Net Month Interest Earned</b>	<b>\$50.80</b>
<b>Total monthly Allocation to Reserves</b>	<b>\$49,099.05</b>
<i>\$15.58 per unit monthly</i>	

**Sudden Valley Community Association - Roads**  
**Cash Flow Method - Current Funding Model Projection**

Beginning Balance: \$1,734,047

Year	Annual Contribution	Annual Interest	Annual Expenditures	Projected Ending Reserves	Fully Funded Reserves	Percent Funded
2017	588,579	610	1,443,477	879,759	5,419,427	16%
2018	588,579		1,518,885	-50,547	5,116,953	-1%
2019	588,579		1,402,452	-864,420	4,950,373	-17%
2020	588,579		1,508,450	-1,784,292	4,701,329	-38%
2021	588,579		1,626,702	-2,822,415	4,356,198	-65%
2022	588,579		1,614,876	-3,848,712	4,043,367	-95%
2023	588,579		2,388,794	-5,648,927	2,978,624	-190%
2024	588,579		1,742,625	-6,802,973	2,564,006	-265%
2025	588,579		1,749,050	-7,963,445	2,163,937	-368%
2026	588,579		1,701,634	-9,076,500	2,457,835	-369%
2027	588,579		1,744,175	-10,232,097	2,765,075	-370%
2028	588,579		1,787,780	-11,431,297	3,086,141	-370%
2029	588,579		1,832,474	-12,675,193	3,421,533	-370%
2030	588,579		1,878,286	-13,964,900	3,771,765	-370%
2031	588,579		1,925,243	-15,301,564	4,137,370	-370%
2032	588,579		1,973,374	-16,686,359	4,518,898	-369%
2033	588,579		2,022,709	-18,120,489	4,916,917	-369%
2034	588,579		2,073,276	-19,605,186	5,332,012	-368%
2035	588,579		2,125,108	-21,141,716	5,764,789	-367%
2036	588,579		2,178,236	-22,731,373	6,215,872	-366%
2037	588,579		2,232,692	-24,375,486	6,685,907	-365%
2038	588,579		2,288,509	-26,075,416	7,175,558	-363%
2039	588,579		2,345,722	-27,832,559	7,685,513	-362%
2040	588,579		2,404,365	-29,648,345	8,216,481	-361%
2041	588,579		2,464,474	-31,524,240	8,769,194	-359%
2042	588,579		2,526,086	-33,461,747	9,344,408	-358%
2043	588,579		2,589,238	-35,462,406	9,942,901	-357%
2044	588,579		2,653,969	-37,527,796	10,565,479	-355%
2045	588,579		2,720,318	-39,659,535	11,212,972	-354%
2046	588,579		2,788,326	-41,859,282	11,886,235	-352%

**Sudden Valley Community Association - Roads  
Component Summary By Area**

Description	Date in Service	Replacement Year	Useful	Adjustment	Remaining	Units	Unit Cost	Current Cost
<b>Culverts</b>								
Culvert Work 2017	2017	2017	30	0	0	1 Total	580,930.00	580,930
Culvert Work 2018	2018	2018	30	0	1	1 Total	619,292.00	619,292
Culvert Work 2019	2019	2019	30	0	2	1 Total	472,327.00	472,327
Culvert Work 2020	2020	2020	30	0	3	1 Total	538,199.00	538,199
Culvert Work 2021	2021	2021	30	0	4	1 Total	611,165.00	611,165
Culvert Work 2022	2022	2022	30	0	5	1 Total	564,768.00	564,768
Culvert Work 2023	2023	2023	30	0	6	1 Total	1,197,303.00	1,197,303
Culvert Work 2024	2024	2024	30	0	7	1 Total	603,463.00	603,463
Culvert Work 2025	2025	2025	30	0	8	1 Total	572,980.00	572,980
Culvert Work 2026+	2026	2026	1	0	9	1 Total	500,000.00	500,000
Culvert Work Annual	2016	2017	1	0	0	1 Total	102,547.00	102,547
Culverts - Total								<u>\$6,362,974</u>
<b>Roads</b>								
Road Work	2015	2017	1	0	0	2 Miles	380,000.00	760,000
Roads - Total								<u>\$760,000</u>
Total Asset Summary								<u>\$7,122,974</u>

**Sudden Valley Community Association - Roads  
Annual Expenditure Detail**

Description	Expenditures
<b>Replacement Year 2017</b>	
Culvert Work 2017	580,930
Culvert Work Annual	102,547
Road Work	760,000
<b>Total for 2017</b>	<b><u>\$1,443,477</u></b>
<b>Replacement Year 2018</b>	
Culvert Work 2018	634,774
Culvert Work Annual	105,111
Road Work	779,000
<b>Total for 2018</b>	<b><u>\$1,518,885</u></b>
<b>Replacement Year 2019</b>	
Culvert Work 2019	496,239
Culvert Work Annual	107,738
Road Work	798,475
<b>Total for 2019</b>	<b><u>\$1,402,452</u></b>
<b>Replacement Year 2020</b>	
Culvert Work 2020	579,581
Culvert Work Annual	110,432
Road Work	818,437
<b>Total for 2020</b>	<b><u>\$1,508,450</u></b>
<b>Replacement Year 2021</b>	
Culvert Work 2021	674,612
Culvert Work Annual	113,193
Road Work	838,898
<b>Total for 2021</b>	<b><u>\$1,626,702</u></b>
<b>Replacement Year 2022</b>	
Culvert Work 2022	638,983
Culvert Work Annual	116,023
Road Work	859,870
<b>Total for 2022</b>	<b><u>\$1,614,876</u></b>



**Sudden Valley Community Association - Roads  
Annual Expenditure Detail**

Description	Expenditures
<b>Replacement Year 2023</b>	
Culvert Work 2023	1,388,504
Culvert Work Annual	118,923
Road Work	881,367
<b>Total for 2023</b>	<b><u>\$2,388,794</u></b>
<b>Replacement Year 2024</b>	
Culvert Work 2024	717,328
Culvert Work Annual	121,896
Road Work	903,401
<b>Total for 2024</b>	<b><u>\$1,742,625</u></b>
<b>Replacement Year 2025</b>	
Culvert Work 2025	698,120
Culvert Work Annual	124,944
Road Work	925,986
<b>Total for 2025</b>	<b><u>\$1,749,050</u></b>
<b>Replacement Year 2026</b>	
Culvert Work 2026+	624,431
Culvert Work Annual	128,067
Road Work	949,136
<b>Total for 2026</b>	<b><u>\$1,701,634</u></b>
<b>Replacement Year 2027</b>	
Culvert Work 2026+	640,042
Culvert Work Annual	131,269
Road Work	972,864
<b>Total for 2027</b>	<b><u>\$1,744,175</u></b>
<b>Replacement Year 2028</b>	
Culvert Work 2026+	656,043
Culvert Work Annual	134,551
Road Work	997,186
<b>Total for 2028</b>	<b><u>\$1,787,780</u></b>

**Sudden Valley Community Association - Roads  
Annual Expenditure Detail**

Description	Expenditures
<b>Replacement Year 2029</b>	
Culvert Work 2026+	672,444
Culvert Work Annual	137,914
Road Work	1,022,116
<b>Total for 2029</b>	<b><u>\$1,832,474</u></b>
<b>Replacement Year 2030</b>	
Culvert Work 2026+	689,256
Culvert Work Annual	141,362
Road Work	1,047,668
<b>Total for 2030</b>	<b><u>\$1,878,286</u></b>
<b>Replacement Year 2031</b>	
Culvert Work 2026+	706,487
Culvert Work Annual	144,896
Road Work	1,073,860
<b>Total for 2031</b>	<b><u>\$1,925,243</u></b>
<b>Replacement Year 2032</b>	
Culvert Work 2026+	724,149
Culvert Work Annual	148,519
Road Work	1,100,707
<b>Total for 2032</b>	<b><u>\$1,973,374</u></b>
<b>Replacement Year 2033</b>	
Culvert Work 2026+	742,253
Culvert Work Annual	152,232
Road Work	1,128,224
<b>Total for 2033</b>	<b><u>\$2,022,709</u></b>
<b>Replacement Year 2034</b>	
Culvert Work 2026+	760,809
Culvert Work Annual	156,037
Road Work	1,156,430
<b>Total for 2034</b>	<b><u>\$2,073,276</u></b>

**Sudden Valley Community Association - Roads  
Annual Expenditure Detail**

Description	Expenditures
<b>Replacement Year 2035</b>	
Culvert Work 2026+	779,829
Culvert Work Annual	159,938
Road Work	1,185,341
<b>Total for 2035</b>	<b>\$2,125,108</b>
<b>Replacement Year 2036</b>	
Culvert Work 2026+	799,325
Culvert Work Annual	163,937
Road Work	1,214,974
<b>Total for 2036</b>	<b>\$2,178,236</b>
<b>Replacement Year 2037</b>	
Culvert Work 2026+	819,308
Culvert Work Annual	168,035
Road Work	1,245,348
<b>Total for 2037</b>	<b>\$2,232,692</b>
<b>Replacement Year 2038</b>	
Culvert Work 2026+	839,791
Culvert Work Annual	172,236
Road Work	1,276,482
<b>Total for 2038</b>	<b>\$2,288,509</b>
<b>Replacement Year 2039</b>	
Culvert Work 2026+	860,786
Culvert Work Annual	176,542
Road Work	1,308,394
<b>Total for 2039</b>	<b>\$2,345,722</b>
<b>Replacement Year 2040</b>	
Culvert Work 2026+	882,305
Culvert Work Annual	180,956
Road Work	1,341,104
<b>Total for 2040</b>	<b>\$2,404,365</b>

**Sudden Valley Community Association - Roads  
Annual Expenditure Detail**

Description	Expenditures
<b>Replacement Year 2041</b>	
Culvert Work 2026+	904,363
Culvert Work Annual	185,479
Road Work	1,374,632
<b>Total for 2041</b>	<u><b>\$2,464,474</b></u>
<b>Replacement Year 2042</b>	
Culvert Work 2026+	926,972
Culvert Work Annual	190,116
Road Work	1,408,998
<b>Total for 2042</b>	<u><b>\$2,526,086</b></u>
<b>Replacement Year 2043</b>	
Culvert Work 2026+	950,146
Culvert Work Annual	194,869
Road Work	1,444,222
<b>Total for 2043</b>	<u><b>\$2,589,238</b></u>
<b>Replacement Year 2044</b>	
Culvert Work 2026+	973,900
Culvert Work Annual	199,741
Road Work	1,480,328
<b>Total for 2044</b>	<u><b>\$2,653,969</b></u>
<b>Replacement Year 2045</b>	
Culvert Work 2026+	998,248
Culvert Work Annual	204,735
Road Work	1,517,336
<b>Total for 2045</b>	<u><b>\$2,720,318</b></u>
<b>Replacement Year 2046</b>	
Culvert Work 2026+	1,023,204
Culvert Work Annual	209,853
Road Work	1,555,270
<b>Total for 2046</b>	<u><b>\$2,788,326</b></u>

**Sudden Valley Community Association - Roads  
Detail Report by Area**

**Culvert Work 2017**

		1 Total	@ \$580,930.00
Asset ID	1226	Asset Cost	\$580,930.00
	Culverts	Percent Replacement	100%
	Grounds	Future Cost	\$580,930.00
Placed in Service	January 2017		
Useful Life	30		
Replacement Year	2017		
Remaining Life	0		

This provision is for annual culvert maintenance and repairs in 2017. In December 2014, Wilson Engineering, LLC prepared the Phase II Stormwater Master Plan and Capital Improvement Plan for the maintenance and replacement of culverts from the years 2015-2025. At the end of the period, a new plan will need to be created.

The cost and useful life are based on information from Wilson Engineering.

**Culvert Work 2018**

		1 Total	@ \$619,292.00
Asset ID	1234	Asset Cost	\$619,292.00
	Culverts	Percent Replacement	100%
	Grounds	Future Cost	\$634,774.30
Placed in Service	January 2018		
Useful Life	30		
Replacement Year	2018		
Remaining Life	1		

This provision is for annual culvert maintenance and repairs in 2018. In December 2014, Wilson Engineering, LLC prepared the Phase II Stormwater Master Plan and Capital Improvement Plan for the maintenance and replacement of culverts from the years 2015-2025. At the end of the period, a new plan will need to be created.

The cost and useful life are based on information from Wilson Engineering.

**Sudden Valley Community Association - Roads  
Detail Report by Area**

**Culvert Work 2019**

		1 Total	@ \$472,327.00
Asset ID	1235	Asset Cost	\$472,327.00
	Culverts	Percent Replacement	100%
	Grounds	Future Cost	\$496,238.55
Placed in Service	January 2019		
Useful Life	30		
Replacement Year	2019		
Remaining Life	2		

This provision is for annual culvert maintenance and repairs in 2019. In December 2014, Wilson Engineering, LLC prepared the Phase II Stormwater Master Plan and Capital Improvement Plan for the maintenance and replacement of culverts from the years 2015-2025. At the end of the period, a new plan will need to be created.

The cost and useful life are based on information from Wilson Engineering.

**Culvert Work 2020**

		1 Total	@ \$538,199.00
Asset ID	1236	Asset Cost	\$538,199.00
	Culverts	Percent Replacement	100%
	Grounds	Future Cost	\$579,581.46
Placed in Service	January 2020		
Useful Life	30		
Replacement Year	2020		
Remaining Life	3		

This provision is for annual culvert maintenance and repairs in 2020. In December 2014, Wilson Engineering, LLC prepared the Phase II Stormwater Master Plan and Capital Improvement Plan for the maintenance and replacement of culverts from the years 2015-2025. At the end of the period, a new plan will need to be created.

The cost and useful life are based on information from Wilson Engineering.

**Sudden Valley Community Association - Roads  
Detail Report by Area**

<b>Culvert Work 2021</b>		1 Total	@ \$611,165.00
Asset ID	1237	Asset Cost	\$611,165.00
	Culverts	Percent Replacement	100%
	Grounds	Future Cost	\$674,611.81
Placed in Service	January 2021		
Useful Life	30		
Replacement Year	2021		
Remaining Life	4		

This provision is for annual culvert maintenance and repairs in 2021. In December 2014, Wilson Engineering, LLC prepared the Phase II Stormwater Master Plan and Capital Improvement Plan for the maintenance and replacement of culverts from the years 2015-2025. At the end of the period, a new plan will need to be created.

The cost and useful life are based on information from Wilson Engineering.

<b>Culvert Work 2022</b>		1 Total	@ \$564,768.00
Asset ID	1238	Asset Cost	\$564,768.00
	Culverts	Percent Replacement	100%
	Grounds	Future Cost	\$638,983.15
Placed in Service	January 2022		
Useful Life	30		
Replacement Year	2022		
Remaining Life	5		

This provision is for annual culvert maintenance and repairs in 2022. In December 2014, Wilson Engineering, LLC prepared the Phase II Stormwater Master Plan and Capital Improvement Plan for the maintenance and replacement of culverts from the years 2015-2025. At the end of the period, a new plan will need to be created.

The cost and useful life are based on information from Wilson Engineering.

**Sudden Valley Community Association - Roads  
Detail Report by Area**

**Culvert Work 2023**

		1 Total @ \$1,197,303.00
Asset ID	1239	Asset Cost \$1,197,303.00
	Culverts	Percent Replacement 100%
	Grounds	Future Cost \$1,388,504.41
Placed in Service	January 2023	
Useful Life	30	
Replacement Year	2023	
Remaining Life	6	

This provision is for annual culvert maintenance and repairs in 2023. In December 2014, Wilson Engineering, LLC prepared the Phase II Stormwater Master Plan and Capital Improvement Plan for the maintenance and replacement of culverts from the years 2015-2025. At the end of the period, a new plan will need to be created.

The cost and useful life are based on information from Wilson Engineering.

**Culvert Work 2024**

		1 Total @ \$603,463.00
Asset ID	1240	Asset Cost \$603,463.00
	Culverts	Percent Replacement 100%
	Grounds	Future Cost \$717,327.87
Placed in Service	January 2024	
Useful Life	30	
Replacement Year	2024	
Remaining Life	7	

This provision is for annual culvert maintenance and repairs in 2024. In December 2014, Wilson Engineering, LLC prepared the Phase II Stormwater Master Plan and Capital Improvement Plan for the maintenance and replacement of culverts from the years 2015-2025. At the end of the period, a new plan will need to be created.

The cost and useful life are based on information from Wilson Engineering.



**Sudden Valley Community Association - Roads  
Detail Report by Area**

**Culvert Work 2025**

		1 Total	@ \$572,980.00
Asset ID	1241	Asset Cost	\$572,980.00
	Culverts	Percent Replacement	100%
	Grounds	Future Cost	\$698,120.49
Placed in Service	January 2025		
Useful Life	30		
Replacement Year	2025		
Remaining Life	8		

This provision is for annual culvert maintenance and repairs in 2025. In December 2014, Wilson Engineering, LLC prepared the Phase II Stormwater Master Plan and Capital Improvement Plan for the maintenance and replacement of culverts from the years 2015-2025. At the end of the period, a new plan will need to be created.

The cost and useful life are based on information from Wilson Engineering.

**Culvert Work 2026+**

		1 Total	@ \$500,000.00
Asset ID	1242	Asset Cost	\$500,000.00
	Culverts	Percent Replacement	100%
	Grounds	Future Cost	\$624,431.48
Placed in Service	January 2026		
Useful Life	1		
Replacement Year	2026		
Remaining Life	9		

This provision is for annual culvert maintenance and repairs in 2026+. In December 2014, Wilson Engineering, LLC prepared the Phase II Stormwater Master Plan and Capital Improvement Plan for the maintenance and replacement of culverts from the years 2015-2025. At the end of the period, a new plan will need to be created.

From the years 2026+ an average of \$500,000 per year is spent for culvert maintenance and replacement.

The cost and useful life are based on information from Wilson Engineering.

**Sudden Valley Community Association - Roads  
Detail Report by Area**

<b>Culvert Work Annual</b>		1 Total	@ \$102,547.00
Asset ID	1244	Asset Cost	\$102,547.00
	Culverts	Percent Replacement	100%
	Grounds	Future Cost	\$102,547.00
Placed in Service	January 2016		
Useful Life	1		
Replacement Year	2017		
Remaining Life	0		

This provision was approved by the membership in a 2016 special election requiring significant annual maintenance work on ditches, culverts and swales necessary for the long-term maintenance of the roads. This is anticipated for one cycle to take 10 years.

**Culverts - Total Current Cost                      \$6,362,974**

**Sudden Valley Community Association - Roads  
Detail Report by Area**

<b>Road Work</b>		2 Miles	@ \$380,000.00
Asset ID	1225	Asset Cost	\$760,000.00
	Roads	Percent Replacement	100%
	Grounds	Future Cost	\$760,000.00
Placed in Service	January 2015		
Useful Life	1		
Replacement Year	2017		
Remaining Life	0		

This provision is for annual road maintenance and repairs. Per the Association:

We have about 40 miles of roads (as shown by the GIS data surveys just completed)

- For the purpose of this discussion there are three types:
- Type 1 structurally sound roads requiring overlay to extend life 20 years,
- Type 2 roads requiring isolated areas of pavement rehabilitation prior to the overlay, and
- Type 3 failed road segments requiring full removal and replacement for new 20-year service.
- In 2016 dollars:
- Overlay of Type 1 roads is estimated at \$215,000/ mile plus permits, Construction Management and overhead costs to the Association.
- Rebuilding of Type 2 roads is estimated at \$325,000/ mile plus permits, Construction Management and overhead costs to the Association

Type 3 roads are estimated at \$395,000/1 mile plus permits, Construction Management and overhead costs to the Association

- We expect 6% of our roads are Type 3 (as of 2016 inspections).
- Expect 4% of our roads are Type 2 (as of 2016 inspections).
- Road work should be started at a pace of 2 miles/ year for 20 years.
- The estimated price tag in 2016 dollars is \$9,208,000 plus indirect costs and Construction Management.

An estimated cost of \$380,000 per mile is used.

<b>Roads - Total Current Cost</b>	<b>\$760,000</b>
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**Sudden Valley Community Association - Roads**  
 Bellingham, Washington  
**Fully Funded Method Summary**

<b>Report Date</b>	<b>May 24, 2016</b>
<b>Account Number</b>	<b>2sudde</b>
<b>Budget Year Beginning</b>	<b>January 01, 2017</b>
<b>Budget Year Ending</b>	<b>December 31, 2017</b>
<b>Total Units</b>	<b>3152</b>

<i>Report Parameters</i>	
<b>Inflation</b>	<b>2.50%</b>
<b>Interest Rate on Reserve Deposit</b>	<b>0.10%</b>
<b>2017 Beginning Balance</b>	<b>\$1,734,047.00</b>

**Full Funding**  
**100% Funded Model Summary**

- This scenario uses the fully funded method. A goal of being 100% funded is used.
- The following items were not included in the analysis because they have useful lives greater than 30 years: grading/drainage; foundation/footings; storm drains; telephone, cable, and internet lines.
- This funding scenario begins with an initial contribution of **\$2,423,647** in **2017** and varies each year for the remaining years of the study. A goal of being 100% funded is used.
- The purpose of this study is to insure that adequate replacement funds are available when components reach the end of their useful life. Components will be replaced as required, not necessarily in their expected replacement year. This analysis should be updated annually.

<i>Fully Funded Method Summary of Calculations</i>	
<b>Required monthly Contribution</b>	<b>\$201,970.62</b>
<i>\$64.08 per unit monthly</i>	
<b>Average Net Month Interest Earned</b>	<u><b>\$133.66</b></u>
<b>Total monthly Allocation to Reserves</b>	<b>\$202,104.28</b>
<i>\$64.12 per unit monthly</i>	

**Sudden Valley Community Association - Roads  
Fully Funded Method Projection**

Beginning Balance: \$1,734,047

Year	Annual Contribution	Annual Interest	Annual Expenditures	Projected Ending Reserves	Fully Funded Reserves	Percent Funded
2017	2,423,647	1,604	1,443,477	2,715,821	5,419,427	50%
2018	1,855,801	2,203	1,518,885	3,054,940	5,116,953	60%
2019	1,773,099	2,614	1,402,452	3,428,202	4,950,373	69%
2020	1,732,827	2,860	1,508,450	3,655,438	4,701,329	78%
2021	1,656,819	2,927	1,626,702	3,688,482	4,356,198	85%
2022	1,589,126	2,936	1,614,876	3,665,668	4,043,367	91%
2023	1,502,000	2,091	2,388,794	2,780,965	2,978,624	93%
2024	1,528,736	1,867	1,742,625	2,568,943	2,564,006	100%
2025	1,548,327	1,659	1,749,050	2,369,879	2,163,937	110%
2026	1,583,967	1,527	1,701,634	2,253,738	2,457,835	92%
2027	1,628,213	1,392	1,744,175	2,139,168	2,765,075	77%
2028	1,683,340	1,264	1,787,780	2,035,992	3,086,141	66%
2029	1,741,914	1,147	1,832,474	1,946,579	3,421,533	57%
2030	1,803,935	1,046	1,878,286	1,873,274	3,771,765	50%
2031	1,869,547	961	1,925,243	1,818,539	4,137,370	44%
2032	1,939,002	896	1,973,374	1,785,062	4,518,898	40%
2033	2,012,263	853	2,022,709	1,775,469	4,916,917	36%
2034	2,089,692	834	2,073,276	1,792,719	5,332,012	34%
2035	2,172,026	844	2,125,108	1,840,481	5,764,789	32%
2036	2,259,342	886	2,178,236	1,922,473	6,215,872	31%
2037	2,352,038	964	2,232,692	2,042,783	6,685,907	31%
2038	2,450,545	1,082	2,288,509	2,205,900	7,175,558	31%
2039	2,555,792	1,245	2,345,722	2,417,215	7,685,513	31%
2040	2,669,024	1,459	2,404,365	2,683,334	8,216,481	33%
2041	2,790,374	1,731	2,464,474	3,010,964	8,769,194	34%
2042	2,920,061	2,067	2,526,086	3,407,007	9,344,408	36%
2043	3,057,190	2,475	2,589,238	3,877,433	9,942,901	39%
2044	3,208,839	2,963	2,653,969	4,435,266	10,565,479	42%
2045	3,374,169	3,544	2,720,318	5,092,660	11,212,972	45%
2046	3,565,478	4,237	2,788,326	5,874,049	11,886,235	49%

**Sudden Valley Community Association - Roads**  
 Bellingham, Washington  
**Baseline Funding Model Summary**

<b>Report Date</b>	<b>May 24, 2016</b>
<b>Account Number</b>	<b>2sude</b>
<b>Budget Year Beginning</b>	<b>January 01, 2017</b>
<b>Budget Year Ending</b>	<b>December 31, 2017</b>
<b>Total Units</b>	<b>3152</b>

<i>Report Parameters</i>	
<b>Inflation</b>	<b>2.50%</b>
<b>Annual Assessment Increase</b>	<b>2.50%</b>
<b>Interest Rate on Reserve Deposit</b>	<b>0.10%</b>
<b>2017 Beginning Balance</b>	<b>\$1,734,047.00</b>

**Baseline Funding  
 Fully Reserved Model Summary**

- This study utilizes the cash flow method and the threshold funding model, which establishes a reserve funding goal that keeps the reserve balance above 0 dollars. This scenario represents the minimum funding requirement.
- The following items were not included in the analysis because they have useful lives greater than 30 years: grading/drainage; foundation/footings; storm drains; telephone, cable, and internet lines.
- This funding scenario begins with a contribution of **\$1,355,552** in **2017** and increases **2.50%** each year for the remaining years of the study. A minimum balance of **\$1** is maintained.
- The purpose of this study is to insure that adequate replacement funds are available when components reach the end of their useful life. Components will be replaced as required, not necessarily in their expected replacement year. This analysis should be updated annually.

<i>Baseline Threshold Method Summary of Calculations</i>	
<b>Required monthly Contribution</b>	<b>\$112,962.65</b>
<i>\$35.84 per unit monthly</i>	
<b>Average Net Month Interest Earned</b>	<u><b>\$85.43</b></u>
<b>Total monthly Allocation to Reserves</b>	<b>\$113,048.08</b>
<i>\$35.87 per unit monthly</i>	

**Sudden Valley Community Association - Roads  
Baseline Funding Model Projection**

Beginning Balance: \$1,734,047

Year	Annual Contribution	Annual Interest	Annual Expenditures	Projected Ending Reserves	Fully Funded Reserves	Percent Funded
2017	1,355,552	1,025	1,443,477	1,647,147	5,419,427	30%
2018	1,389,441	881	1,518,885	1,518,584	5,116,953	30%
2019	1,424,177	888	1,402,452	1,541,196	4,950,373	31%
2020	1,459,781	824	1,508,450	1,493,351	4,701,329	32%
2021	1,496,276	677	1,626,702	1,363,601	4,356,198	31%
2022	1,533,682	580	1,614,876	1,282,987	4,043,367	32%
2023	1,572,024		2,388,794	466,217	2,978,624	16%
2024	1,611,325		1,742,625	334,917	2,564,006	13%
2025	1,651,608		1,749,050	237,475	2,163,937	11%
2026	1,692,898		1,701,634	228,739	2,457,835	9%
2027	1,735,221		1,744,175	219,785	2,765,075	8%
2028	1,778,601		1,787,780	210,606	3,086,141	7%
2029	1,823,066		1,832,474	201,199	3,421,533	6%
2030	1,868,643		1,878,286	191,556	3,771,765	5%
2031	1,915,359		1,925,243	181,672	4,137,370	4%
2032	1,963,243		1,973,374	171,540	4,518,898	4%
2033	2,012,324		2,022,709	161,156	4,916,917	3%
2034	2,062,632		2,073,276	150,512	5,332,012	3%
2035	2,114,198		2,125,108	139,602	5,764,789	2%
2036	2,167,053		2,178,236	128,419	6,215,872	2%
2037	2,221,229		2,232,692	116,957	6,685,907	2%
2038	2,276,760		2,288,509	105,208	7,175,558	1%
2039	2,333,679		2,345,722	93,165	7,685,513	1%
2040	2,392,021		2,404,365	80,821	8,216,481	1%
2041	2,451,822		2,464,474	68,169	8,769,194	1%
2042	2,513,117		2,526,086	55,200	9,344,408	1%
2043	2,575,945		2,589,238	41,907	9,942,901	0%
2044	2,640,344		2,653,969	28,282	10,565,479	0%
2045	2,706,352		2,720,318	14,316	11,212,972	0%
2046	2,774,011		2,788,326	1	11,886,235	0%

**SUDDEN VALLEY COMMUNITY ASSOCIATION**  
**ROADS**  
**RESERVE STUDY**  
**LEVEL I: FULL RESERVE STUDY FUNDING ANALYSIS**  
**2017**





**Sudden Valley Community Association - Roads**  
 Bellingham, Washington  
**Cash Flow Method - Current Funding Model Summary**

<b>Report Date</b>	<b>May 24, 2016</b>
<b>Account Number</b>	<b>2sudde</b>
<b>Budget Year Beginning</b>	<b>January 01, 2017</b>
<b>Budget Year Ending</b>	<b>December 31, 2017</b>
<b>Total Units</b>	<b>3152</b>

<i>Report Parameters</i>	
<b>Inflation</b>	<b>2.50%</b>
<b>Interest Rate on Reserve Deposit</b>	<b>0.10%</b>
<b>2017 Beginning Balance</b>	<b>\$1,734,047.00</b>

**Revitalization Summary**

- This study utilizes the cash flow method and the threshold funding model, which establishes a reserve funding goal that keeps the reserve balance above a specified dollar or percent funded amount.
- The following items were not included in the analysis because they have useful lives greater than 30 years: grading/drainage; foundation/footings; storm drains; telephone, cable, and internet lines.
- This funding scenario begins with a contribution of **\$588,579 in 2017, \$3,988,953 from 2019-2021, \$588,953 in 2022, \$1,340,000 in 2023, \$600,000 in 2024** and increases **10%** each year for the remaining years of the study. A minimum balance of **-\$5,757,620** is maintained.
- The purpose of this study is to insure that adequate replacement funds are available when components reach the end of their useful life. Components will be replaced as required, not necessarily in their expected replacement year. This analysis should be updated annually.

<i>Cash Flow Method - Threshold Funding Model Summary of Calculations</i>	
<b>Required monthly Contribution</b>	<b>\$49,048.25</b>
<i>\$15.56 per unit monthly</i>	
<b>Average Net Month Interest Earned</b>	<u><b>\$114.16</b></u>
<b>Total monthly Allocation to Reserves</b>	<b>\$49,162.41</b>
<i>\$15.60 per unit monthly</i>	

**Sudden Valley Community Association - Roads  
Cash Flow Method - Current Funding Model Projection**

Beginning Balance: \$1,734,047

Year	Annual Contribution	Annual Interest	Annual Expenditures	Projected Ending Reserves	Fully Funded Reserves	Percent Funded
2017	588,579	1,370	683,477	1,640,519	4,659,427	35%
2018	588,579	1,220	739,885	1,490,433	4,337,953	34%
2019	3,988,953		4,176,102	1,303,284	4,151,898	31%
2020	3,988,953		4,351,441	940,795	3,882,892	24%
2021	3,988,953		4,540,768	388,980	3,517,301	11%
2022	588,953		755,006	222,927	3,183,496	7%
2023	1,340,000		1,507,427	55,500	2,097,257	3%
2024	600,000		839,224	-183,724	1,660,605	-11%
2025	660,000		823,064	-346,788	1,237,951	-28%
2026	726,000		752,499	-373,287	1,508,699	-25%
2027	798,600		771,311	-345,998	1,792,211	-19%
2028	878,460		790,594	-258,132	2,088,955	-12%
2029	966,306		810,359	-102,184	2,399,417	-4%
2030	1,062,937		830,618	130,134	2,724,096	5%
2031	1,169,230		851,383	447,982	3,063,510	15%
2032	1,286,153	272	872,668	861,739	3,418,191	25%
2033	1,414,769	734	894,484	1,382,757	3,788,692	36%
2034	1,556,245	1,309	916,847	2,023,465	4,175,582	48%
2035	1,711,870	2,012	939,768	2,797,580	4,579,448	61%
2036	1,883,057	2,855	963,262	3,720,230	5,000,898	74%
2037	2,071,363	3,856	987,343	4,808,106	5,440,558	88%
2038	2,278,499	5,032	1,012,027	6,079,610	5,899,076	103%
2039	2,506,349	891	6,546,356	2,040,494	6,377,119	32%
2040	2,756,984		6,710,015	-1,912,537	6,875,377	-28%
2041	3,032,682		6,877,765	-5,757,620	7,394,563	-78%
2042	3,335,950		1,117,088	-3,538,758	7,935,410	-45%
2043	3,669,545		1,145,016	-1,014,229	8,498,679	-12%
2044	4,036,500		1,173,641	1,848,630	9,085,151	20%
2045	4,440,150	3,052	1,202,982	5,088,850	9,695,635	52%
2046	4,884,165	6,504	1,233,057	8,746,462	10,330,966	85%

**Sudden Valley Community Association - Roads  
Component Summary By Area**

Description	Date in Service	Replacement Year	Useful	Adjustment	Remaining	Units	Unit Cost	Current Cost
<b>Culverts</b>								
Culvert Work 2017	2017	2017	30	0	0	1 Total	580,930.00	580,930
Culvert Work 2018	2018	2018	30	0	1	1 Total	619,292.00	619,292
Culvert Work 2019	2019	2019	30	0	2	1 Total	472,327.00	472,327
Culvert Work 2020	2020	2020	30	0	3	1 Total	538,199.00	538,199
Culvert Work 2021	2021	2021	30	0	4	1 Total	611,165.00	611,165
Culvert Work 2022	2022	2022	30	0	5	1 Total	564,768.00	564,768
Culvert Work 2023	2023	2023	30	0	6	1 Total	1,197,303.00	1,197,303
Culvert Work 2024	2024	2024	30	0	7	1 Total	603,463.00	603,463
Culvert Work 2025	2025	2025	30	0	8	1 Total	572,980.00	572,980
Culvert Work 2026+	2026	2026	1	0	9	1 Total	500,000.00	500,000
Culvert Work Annual	2016	2017	1	0	0	1 Total	102,547.00	102,547
Culverts - Total								<u>\$6,362,974</u>
<b>Roads</b>								
Road Work 2019-2022	2019	2019	1	0	2	1 Total	3,400,000.00	3,400,000
Roads 2039 - 2041	2039	2039	1	0	22	1 Total	3,200,000.00	3,200,000
Roads - Total								<u>\$6,600,000</u>
Total Asset Summary								<u>\$12,962,974</u>

**Sudden Valley Community Association - Roads  
Annual Expenditure Detail**

Description	Expenditures
<b>Replacement Year 2017</b>	
Culvert Work 2017	580,930
Culvert Work Annual	102,547
<b>Total for 2017</b>	<b>\$683,477</b>
<b>Replacement Year 2018</b>	
Culvert Work 2018	634,774
Culvert Work Annual	105,111
<b>Total for 2018</b>	<b>\$739,885</b>
<b>Replacement Year 2019</b>	
Culvert Work 2019	496,239
Culvert Work Annual	107,738
Road Work 2019-2022	3,572,125
<b>Total for 2019</b>	<b>\$4,176,102</b>
<b>Replacement Year 2020</b>	
Culvert Work 2020	579,581
Culvert Work Annual	110,432
Road Work 2019-2022	3,661,428
<b>Total for 2020</b>	<b>\$4,351,441</b>
<b>Replacement Year 2021</b>	
Culvert Work 2021	674,612
Culvert Work Annual	113,193
Road Work 2019-2022	3,752,964
<b>Total for 2021</b>	<b>\$4,540,768</b>
<b>Replacement Year 2022</b>	
Culvert Work 2022	638,983
Culvert Work Annual	116,023
<b>Total for 2022</b>	<b>\$755,006</b>
<b>Replacement Year 2023</b>	
Culvert Work 2023	1,388,504

**Sudden Valley Community Association - Roads  
Annual Expenditure Detail**

Description	Expenditures
<i>Replacement Year 2023 continued...</i>	
Culvert Work Annual	118,923
<b>Total for 2023</b>	<b>\$1,507,427</b>
<b>Replacement Year 2024</b>	
Culvert Work 2024	717,328
Culvert Work Annual	121,896
<b>Total for 2024</b>	<b>\$839,224</b>
<b>Replacement Year 2025</b>	
Culvert Work 2025	698,120
Culvert Work Annual	124,944
<b>Total for 2025</b>	<b>\$823,064</b>
<b>Replacement Year 2026</b>	
Culvert Work 2026+	624,431
Culvert Work Annual	128,067
<b>Total for 2026</b>	<b>\$752,499</b>
<b>Replacement Year 2027</b>	
Culvert Work 2026+	640,042
Culvert Work Annual	131,269
<b>Total for 2027</b>	<b>\$771,311</b>
<b>Replacement Year 2028</b>	
Culvert Work 2026+	656,043
Culvert Work Annual	134,551
<b>Total for 2028</b>	<b>\$790,594</b>
<b>Replacement Year 2029</b>	
Culvert Work 2026+	672,444
Culvert Work Annual	137,914
<b>Total for 2029</b>	<b>\$810,359</b>

**Sudden Valley Community Association - Roads  
Annual Expenditure Detail**

Description	Expenditures
<b>Replacement Year 2030</b>	
Culvert Work 2026+	689,256
Culvert Work Annual	141,362
<b>Total for 2030</b>	<b>\$830,618</b>
<b>Replacement Year 2031</b>	
Culvert Work 2026+	706,487
Culvert Work Annual	144,896
<b>Total for 2031</b>	<b>\$851,383</b>
<b>Replacement Year 2032</b>	
Culvert Work 2026+	724,149
Culvert Work Annual	148,519
<b>Total for 2032</b>	<b>\$872,668</b>
<b>Replacement Year 2033</b>	
Culvert Work 2026+	742,253
Culvert Work Annual	152,232
<b>Total for 2033</b>	<b>\$894,484</b>
<b>Replacement Year 2034</b>	
Culvert Work 2026+	760,809
Culvert Work Annual	156,037
<b>Total for 2034</b>	<b>\$916,847</b>
<b>Replacement Year 2035</b>	
Culvert Work 2026+	779,829
Culvert Work Annual	159,938
<b>Total for 2035</b>	<b>\$939,768</b>
<b>Replacement Year 2036</b>	
Culvert Work 2026+	799,325
Culvert Work Annual	163,937
<b>Total for 2036</b>	<b>\$963,262</b>

**Sudden Valley Community Association - Roads  
Annual Expenditure Detail**

Description	Expenditures
<b>Replacement Year 2037</b>	
Culvert Work 2026+	819,308
Culvert Work Annual	168,035
<b>Total for 2037</b>	<u><b>\$987,343</b></u>
<b>Replacement Year 2038</b>	
Culvert Work 2026+	839,791
Culvert Work Annual	172,236
<b>Total for 2038</b>	<u><b>\$1,012,027</b></u>
<b>Replacement Year 2039</b>	
Culvert Work 2026+	860,786
Culvert Work Annual	176,542
Roads 2039 - 2041	5,509,028
<b>Total for 2039</b>	<u><b>\$6,546,356</b></u>
<b>Replacement Year 2040</b>	
Culvert Work 2026+	882,305
Culvert Work Annual	180,956
Roads 2039 - 2041	5,646,754
<b>Total for 2040</b>	<u><b>\$6,710,015</b></u>
<b>Replacement Year 2041</b>	
Culvert Work 2026+	904,363
Culvert Work Annual	185,479
Roads 2039 - 2041	5,787,923
<b>Total for 2041</b>	<u><b>\$6,877,765</b></u>
<b>Replacement Year 2042</b>	
Culvert Work 2026+	926,972
Culvert Work Annual	190,116
<b>Total for 2042</b>	<u><b>\$1,117,088</b></u>
<b>Replacement Year 2043</b>	
Culvert Work 2026+	950,146

**Sudden Valley Community Association - Roads  
Annual Expenditure Detail**

Description	Expenditures
<i>Replacement Year 2043 continued...</i>	
Culvert Work Annual	194,869
<b>Total for 2043</b>	<b>\$1,145,016</b>
<b>Replacement Year 2044</b>	
Culvert Work 2026+	973,900
Culvert Work Annual	199,741
<b>Total for 2044</b>	<b>\$1,173,641</b>
<b>Replacement Year 2045</b>	
Culvert Work 2026+	998,248
Culvert Work Annual	204,735
<b>Total for 2045</b>	<b>\$1,202,982</b>
<b>Replacement Year 2046</b>	
Culvert Work 2026+	1,023,204
Culvert Work Annual	209,853
<b>Total for 2046</b>	<b>\$1,233,057</b>