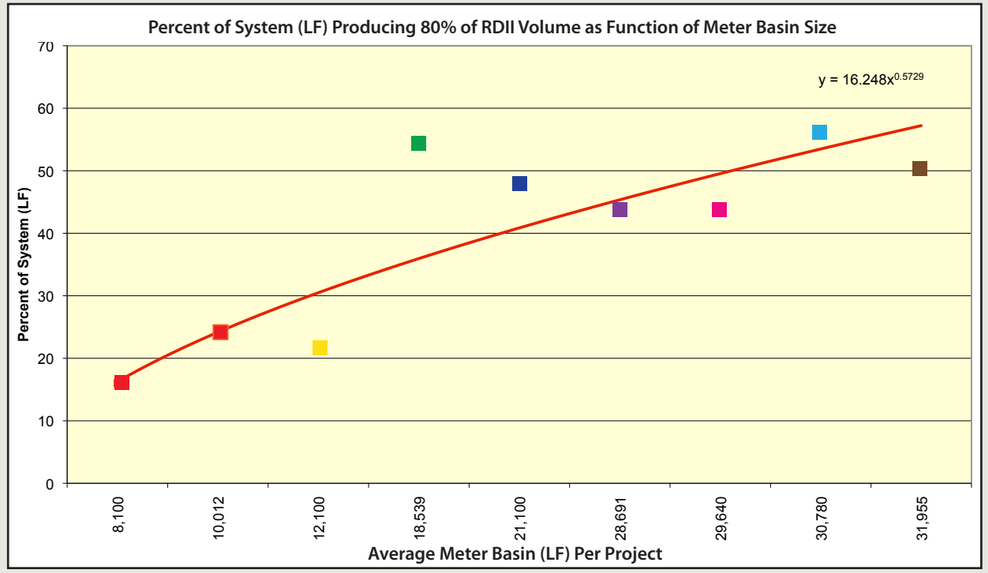


This graph shows several recent RDII projects ADS has performed at different basin sizes. Each data point on this graph shows the average basin size of the study (X-axis) and the percentage of the system that produced 80% of the total RDII (Y-axis). It is evident that with smaller basin-size studies 80% of total RDII volume can be isolated into approximately 20% of the system. Agencies that begin RDII reduction programs with this strategy can work faster and at less cost.

**Percent of System in which 80% of RDII is Found**

| Project | Total System Size | Average Basin Size | % Vol RDII | % System |
|---|---|---|---|---|
| Belmont North | 385,000 LF | 8,100 | 80 | 16 |
| Pennsylvania 1 | 1.2 million LF | 10,012 | 80 | 24 |
| Pennsylvania 2 | 1.7 million LF | 12,100 | 80 | 22 |
| Indiana 2 | 1.02 million LF | 18,539 | 80 | 55 |
| Washington | 16 million | 21,100 | 80 | 48 |
| Maryland 1 | 3.04 million LF | 28,691 | 80 | 44 |
| Maryland 2 | 2.7 million | 29,640 | 80 | 44 |
| Maryland 3 | 1.32 million LF | 30,780 | 80 | 56 |
| Maryland 4 | 1.67 million LF | 31,955 | 80 | 50 |

***Comprehensive Flow Monitoring Reduces Project Costs, Saves Time, and Solves Problems***

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# *Comprehensive Flow Monitoring Delivers Savings of $7 Million and Produces Results Three Years Sooner*

## *Belmont North, Indianapolis, Indiana*

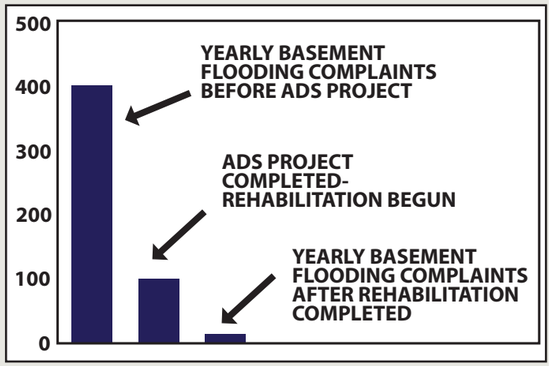
## Basement Floodings Eliminated in 11 Months

Comprehensive flow monitoring provides a staggering return on investment and solves chronic problems for utilities. An analysis of recent RDII projects (Rainfall Dependent I/I) performed by ADS with differing basin sizes (see chart on back page) shows that reducing basin sizes can reduce the area required for rehabilitation resources and speed up the improvement in collection system operation.

The Belmont North area of Indianapolis experienced frequent basement floodings in moderate to heavy rainfall generating approximately 400 residential complaints per year. The city hired a consultant to engineer a solution to basement flooding. A plan was recommended by the consultants to build a $7 million dollar relief sewer.

Instead of investing in these solutions, the Chief Engineer of Indianapolis performed a comprehensive flow monitoring program and installed 57 meters in the 385,000 lf sewer system for 120 days. Basin size was limited to approximately 8100 lf to help diagnose primary trouble spots. The results of the study showed that 16% of the system contained approximately 80% of the I/I.

This allowed the city's consulting engineers to focus rehabilitation efforts on high priority areas for the quickest results. Through an aggressive SSES program designed to locate specific defects and a rehabilitation project, I/I was significantly reduced virtually eliminating basement floodings and improving the cost-effective operation of the collection system.




**Flow Monitoring Rehabilitation Project Reduced Complaints in Belmont North**

## The Return on Investment for Indianapolis

***An investment of approximately $650,000 in flow monitoring cost and $1 million rehabilitation cost resulted in a savings to Indianapolis of over $7 million in proposed relief line construction costs. Additionally, the contract period was reduced by three years and basement floodings were virtually eliminated.***

Comprehensive flow monitoring is the subdivision of a sewershed into small and uniformly-sized meter basins so that RDII volume and sewer operational capacity are measured at each metering point. The result is that causes are separated from symptoms. If the basin size is small enough, RDII in collection systems can conform to the 80/20 Rule of Pareto's Principle. Application of the Rule says that 80% of the total volume of RDII entering a collection system will enter in just 20% of the system. Therefore, rehabilitation can be performed on a smaller portion of the system saving time and expense.

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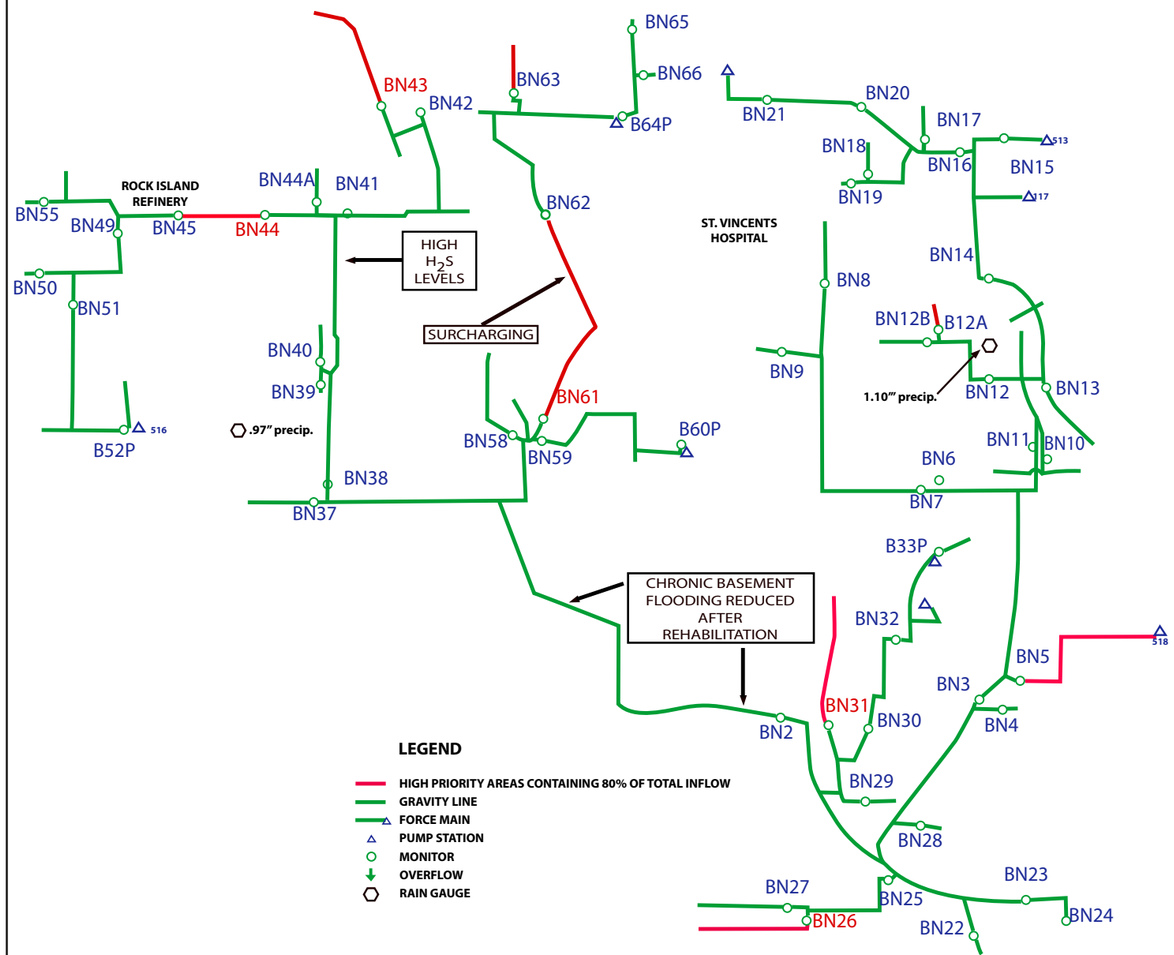
ROI PROFILE

# INFLOW ANALYSIS - INDIANAPOLIS, INDIANA
# NORTH BELMONT INTERCEPTOR




# FLOW ISOLATION ANALYSIS
# ACTUAL INFLOW

| | MINISYSTEM | FOOTAGE | INCH-MILE | CUM-INFL0W | NET-INFL0W | GALLONS/ 1000 FEET | PERCENT TOTAL INFLOW NET | PERCENT TOTAL INFLOW CUM | NORTH BELMONT PERCENT TOTAL FOOTAGE NET | NORTH BELMONT PERCENT TOTAL FOOTAGE CUM |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | BN61 | 29517 | 98.15 | 119.97 | 832.57 | 28206.46 | 68.04 | 68.04 | 7.50 | 7.50 |
| 2 | BN31 | 5136 | 9.27 | 60.24 | 60.24 | 11728.97 | 4.92 | 72.96 | 1.31 | 8.81 |
| 3 | BN44 | 4121 | 18.40 | 34.10 | 22.53 | 5467.12 | 1.84 | 74.80 | 1.05 | 9.85 |
| 4 | BN26 | 3359 | 6.36 | 16.02 | 16.02 | 4769.28 | 1.31 | 76.11 | 0.85 | 10.71 |
| 5 | BN43 | 2475 | 4.39 | 8.88 | 8.88 | 3587.88 | 0.73 | 76.83 | 0.63 | 11.34 |
| 6 | BN5 | 4533 | 7.72 | 13.03 | 13.03 | 2874.48 | 1.06 | 77.90 | 1.15 | 12.49 |
| 7 | B12A | 3437 | 5.92 | 8.09 | 8.09 | 2353.80 | 0.66 | 78.56 | 0.87 | 13.36 |
| 8 | BN63 | 6764 | 10.25 | 15.04 | 15.04 | 2223.54 | 1.23 | 79.79 | 1.72 | 15.08 |
| 9 | BN16,BN19 | 10621 | 19.39 | 43.42 | 22.07 | 2077.96 | 1.80 | 81.59 | 2.70 | 17.78 |
| 10 | BN11,13,14,15 | 28865 | 67.28 | 113.83 | 53.85 | 1865.58 | 4.40 | 85.99 | 7.33 | 25.11 |
| 11 | BN55 | 1281 | 6.55 | 2.31 | 2.31 | 1803.28 | 0.19 | 86.18 | 0.33 | 25.44 |
| 12 | BN49 | 4742 | 13.92 | 20.92 | 8.43 | 1777.73 | 0.69 | 86.87 | 1.20 | 26.64 |
| 13 | BN17 | 3849 | 6.41 | 6.84 | 6.84 | 1777.08 | 0.56 | 87.43 | 0.98 | 27.62 |
| 14 | BN20 | 4724 | 7.92 | 7.87 | 7.47 | 1581.29 | 0.61 | 88.04 | 1.20 | 28.82 |
| 15 | BN50 | 3783 | 6.40 | 5.69 | 5.69 | 1504.10 | 0.46 | 88.50 | 0.96 | 29.78 |
| 16 | BN7,BN9 | 14390 | 47.00 | 21.10 | 21.14 | 1469.08 | 1.73 | 90.23 | 3.66 | 33.44 |
| 17 | BN27 | 2686 | 4.07 | 3.49 | 3.49 | 1299.33 | 0.29 | 90.52 | 0.68 | 34.12 |
| 18 | BN12 | 3221 | 7.14 | 12.51 | 4.08 | 1266.69 | 0.33 | 90.85 | 0.82 | 34.94 |
| 19 | BN38 | 8063 | 33.07 | 66.65 | 10.14 | 1257.60 | 0.83 | 91.68 | 2.05 | 36.99 |
| 20 | BN41 | 6005 | 18.80 | 18.73 | 7.44 | 1238.97 | 0.61 | 92.29 | 1.53 | 38.52 |
| 21 | BN3 | 11820 | 38.91 | 162.21 | 12.66 | 1071.07 | 1.03 | 93.32 | 3.00 | 41.52 |
| 22 | BN30 | 5518 | 9.19 | 9.05 | 5.60 | 1014.86 | 0.46 | 93.78 | 1.40 | 42.92 |
| 23 | BN18 | 6659 | 10.73 | 6.64 | 6.64 | 997.15 | 0.54 | 94.32 | 1.69 | 44.61 |
| 24 | BN24 | 4339 | 7.89 | 4.07 | 4.07 | 938.00 | 0.33 | 94.65 | 1.10 | 45.72 |
| 25 | BN59,B60P | 7977 | 12.08 | 7.41 | 7.41 | 928.92 | 0.61 | 95.26 | 2.03 | 47.74 |
| 26 | BN58 | 2910 | 4.49 | 2.64 | 2.64 | 907.22 | 0.22 | 95.48 | 0.74 | 48.48 |
| 27 | BN62,B64P | 22504 | 44.23 | 37.03 | 15.55 | 690.99 | 1.27 | 96.75 | 5.72 | 54.20 |
| 28 | BN65 | 7535 | 12.20 | 4.85 | 4.85 | 643.66 | 0.40 | 97.14 | 1.91 | 56.12 |
| 29 | B44A | 5163 | 10.23 | 3.18 | 3.18 | 615.92 | 0.26 | 97.40 | 1.31 | 57.43 |
| 30 | BN37 | 8288 | 14.00 | 4.16 | 4.16 | 501.93 | 0.34 | 97.74 | 2.11 | 59.53 |
| 31 | BN10 | 8668 | 18.21 | 4.04 | 4.04 | 466.08 | 0.33 | 98.07 | 2.20 | 61.74 |
| 32 | BN29 | 4727 | 8.16 | 1.61 | 1.61 | 340.60 | 0.13 | 98.20 | 1.20 | 62.94 |
| 33 | BN66 | 5000 | 7.95 | 1.59 | 1.59 | 318.00 | 0.13 | 98.33 | 1.27 | 64.21 |
| 34 | BN25 | 7711 | 15.65 | 21.85 | 2.34 | 303.46 | 0.19 | 98.53 | 1.96 | 66.17 |
| 35 | BN4 | 4308 | 6.67 | 1.24 | 1.24 | 287.84 | 0.10 | 98.63 | 1.09 | 67.26 |
| 36 | BN42 | 8803 | 19.00 | 2.41 | 2.41 | 273.77 | 0.20 | 98.82 | 2.24 | 69.50 |
| 37 | BN6 | 5842 | 9.33 | 1.59 | 1.59 | 272.17 | 0.13 | 98.95 | 1.48 | 70.98 |
| 38 | BN39 | 5533 | 9.04 | 1.28 | 1.28 | 231.34 | 0.10 | 99.06 | 1.41 | 72.39 |
| 39 | BN51,52P,54A,54B | 31031 | 62.28 | 6.80 | 6.80 | 219.14 | 0.56 | 99.61 | 7.89 | 80.28 |
| 40 | BN32,B33P | 18967 | 30.93 | 3.45 | 3.45 | 181.89 | 0.28 | 99.90 | 4.82 | 85.10 |
| 41 | B12B | 2110 | 3.46 | 0.35 | 0.35 | 165.88 | 0.03 | 99.92 | 0.54 | 85.63 |
| 42 | BN21 | 4224 | 6.80 | 0.40 | 0.40 | 94.70 | 0.03 | 99.96 | 1.07 | 86.71 |
| 43 | BN28 | 13352 | 32.47 | 0.52 | 0.52 | 38.95 | 0.04 | 100.00 | 3.39 | 90.10 |
| 44 | BN40 | 4402 | 8.12 | 0.00 | 0.00 | 0.00 | 0.00 | 100.00 | 1.12 | 91.22 |
| 45 | BN22,BN23 | 26419 | 96.37 | 1631.43 | 0.00 | 0.00 | 0.00 | 100.00 | 6.71 | 97.93 |
| 46 | BN8 | 1237 | 2.73 | 0.00 | 0.00 | 0.00 | 0.00 | 100.00 | 0.31 | 98.24 |
| 47 | BN45 | 6909 | 24.11 | 11.57 | 0.00 | 0.00 | 0.00 | 100.00 | 1.76 | 100.00 |
| | Total 57 Meters | 393528 | 923.64 | | 1223.73 | | | | | |

# 80% of the RDII ISOLATED IN ONLY 16% OF THE SYSTEM