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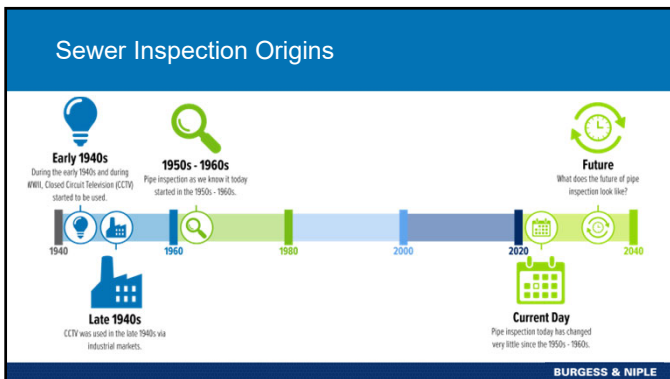
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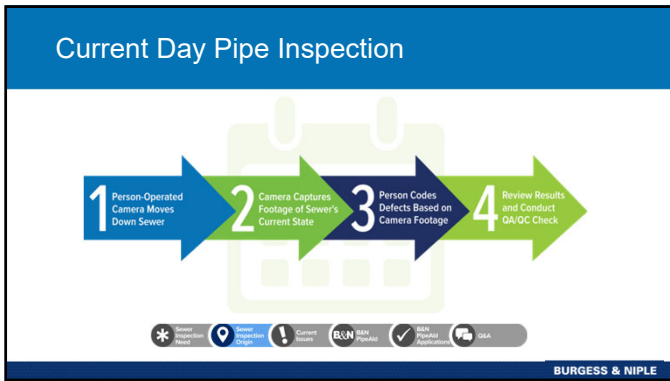
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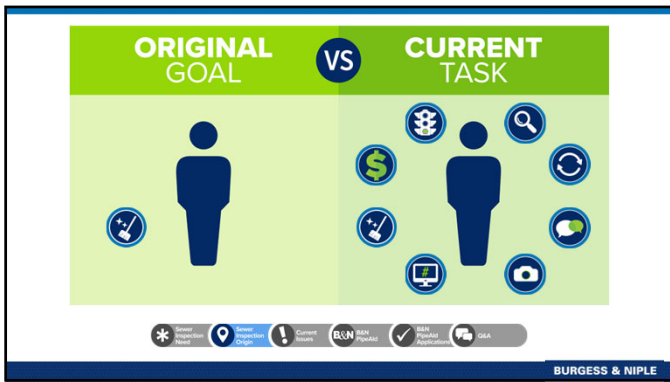
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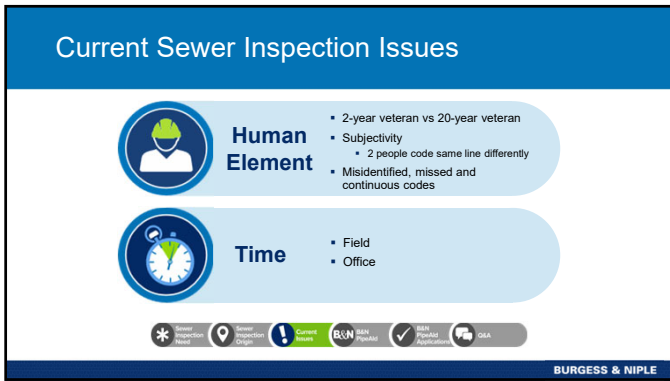
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### Current Sewer Inspection Issues - Time

- Cleaning and Inspection Work
  - Camera Van – 2 Workers
  - Vactor – 1 to 2 workers



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### Current Sewer Inspection Issues - Time

- Time to clean and inspect
  - 300' pipe segment
  - Inspected at 30 fpm
  - 10 min (no coding)
- Typically 20+ minutes



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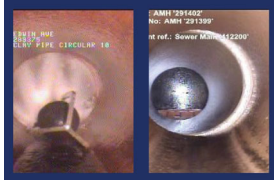
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### Current Sewer Inspection Issues - Time

- Beneficial for camera to follow jet head
  - More efficient
    - Cleaning
    - Root/Deposit Cutting
  - Better coordination between vactor
    - Pulling water level down
- Time in the Office
  - QA/QC
  - Review at 2x or 3x speed



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### Current Sewer Inspection Issues – Reporting

ID	Date	Issue	Location	Status
1	10/15/2023	Crack	1000000000	Open
2	10/15/2023	Crack	1000000000	Open
3	10/15/2023	Crack	1000000000	Open
4	10/15/2023	Crack	1000000000	Open
5	10/15/2023	Crack	1000000000	Open
6	10/15/2023	Crack	1000000000	Open
7	10/15/2023	Crack	1000000000	Open
8	10/15/2023	Crack	1000000000	Open
9	10/15/2023	Crack	1000000000	Open
10	10/15/2023	Crack	1000000000	Open
11	10/15/2023	Crack	1000000000	Open
12	10/15/2023	Crack	1000000000	Open
13	10/15/2023	Crack	1000000000	Open
14	10/15/2023	Crack	1000000000	Open
15	10/15/2023	Crack	1000000000	Open
16	10/15/2023	Crack	1000000000	Open
17	10/15/2023	Crack	1000000000	Open
18	10/15/2023	Crack	1000000000	Open
19	10/15/2023	Crack	1000000000	Open
20	10/15/2023	Crack	1000000000	Open
21	10/15/2023	Crack	1000000000	Open
22	10/15/2023	Crack	1000000000	Open
23	10/15/2023	Crack	1000000000	Open
24	10/15/2023	Crack	1000000000	Open
25	10/15/2023	Crack	1000000000	Open
26	10/15/2023	Crack	1000000000	Open
27	10/15/2023	Crack	1000000000	Open
28	10/15/2023	Crack	1000000000	Open
29	10/15/2023	Crack	1000000000	Open
30	10/15/2023	Crack	1000000000	Open
31	10/15/2023	Crack	1000000000	Open
32	10/15/2023	Crack	1000000000	Open
33	10/15/2023	Crack	1000000000	Open
34	10/15/2023	Crack	1000000000	Open
35	10/15/2023	Crack	1000000000	Open
36	10/15/2023	Crack	1000000000	Open
37	10/15/2023	Crack	1000000000	Open
38	10/15/2023	Crack	1000000000	Open
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40	10/15/2023	Crack	1000000000	Open
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47	10/15/2023	Crack	1000000000	Open
48	10/15/2023	Crack	1000000000	Open
49	10/15/2023	Crack	1000000000	Open
50	10/15/2023	Crack	1000000000	Open

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### The Solution?

PipeAid™

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### A Tool for Efficiency

- AI doesn't replace our engineers, it supplements them
  - Streamlines pipe inspection process
- Unbiased tool to reduce error
  - Same look at the same pipe every time
- Tool for efficiency

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**B&N's PipeAid**

- Uses Machine Learning algorithms paired with Computer Vision that detects and classifies sewer defects

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**B&N's PipeAid**

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**B&N's PipeAid**

**Benefits of Two Models**

- Mimics current process
- No training required
- Utilize existing data and equipment
- More detailed analysis
- Less likely to miss a defect

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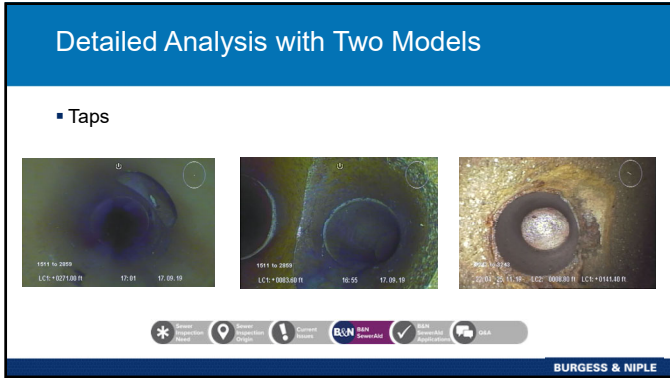
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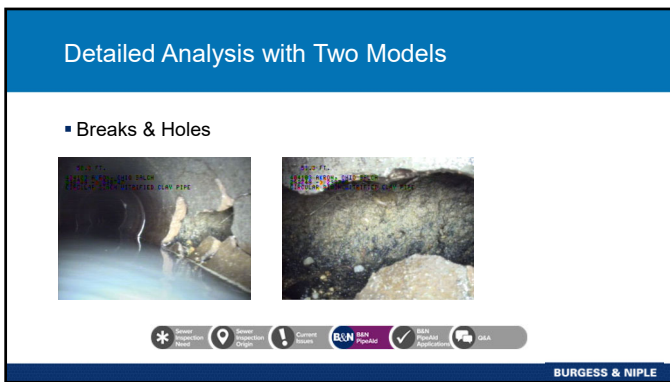
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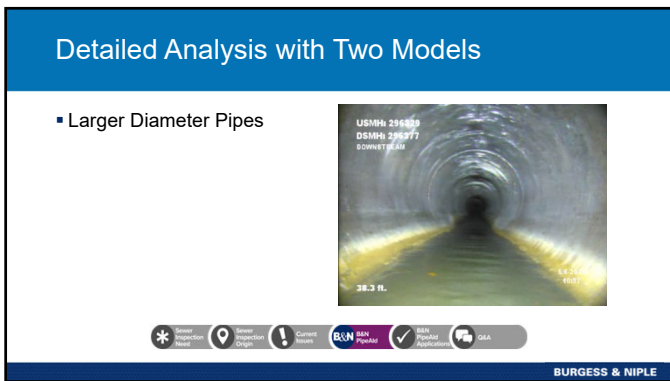
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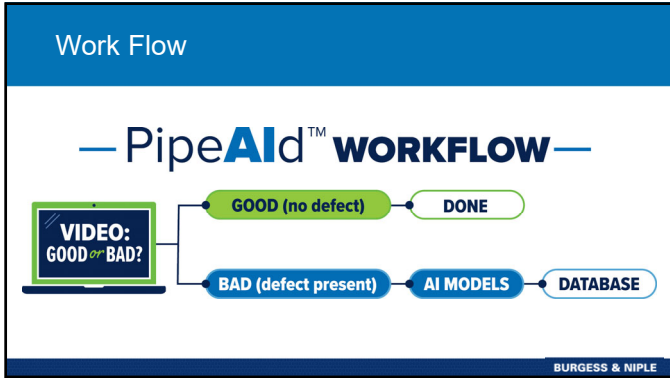
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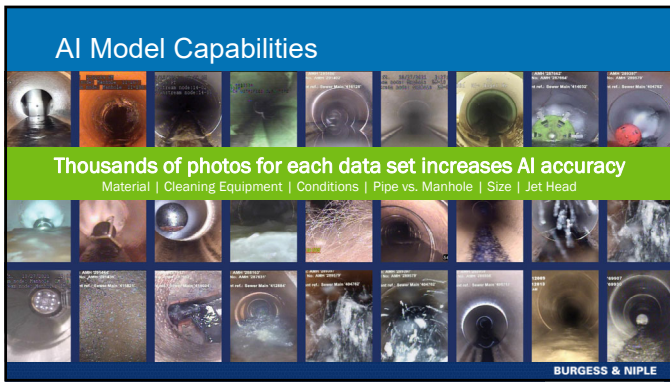
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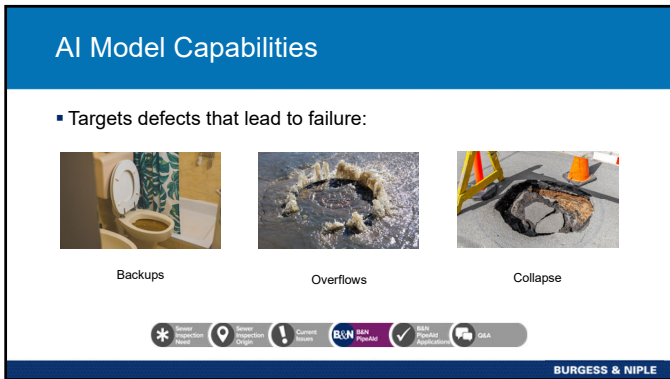
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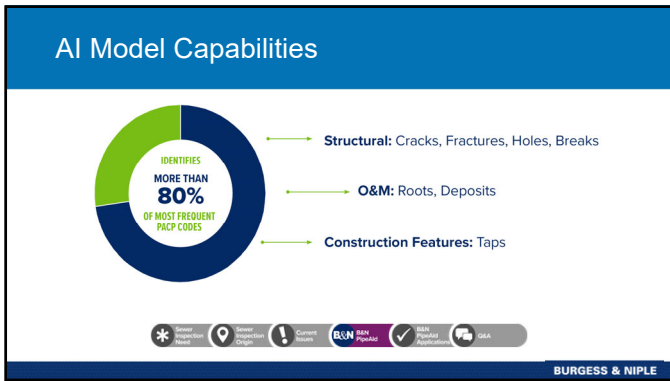
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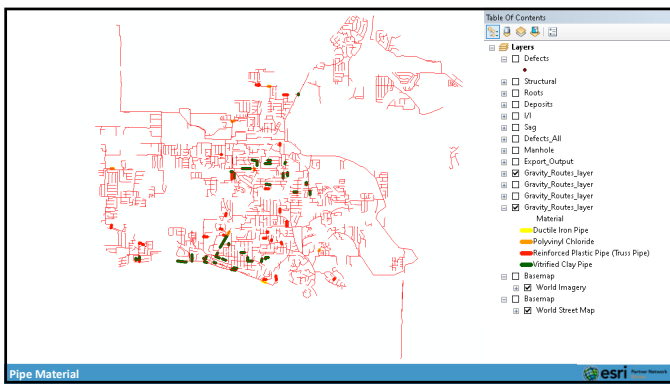
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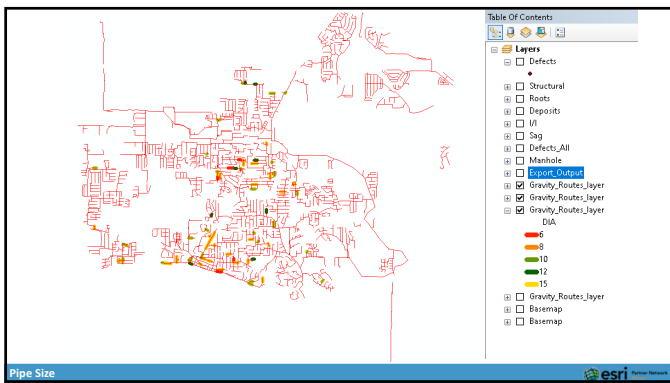
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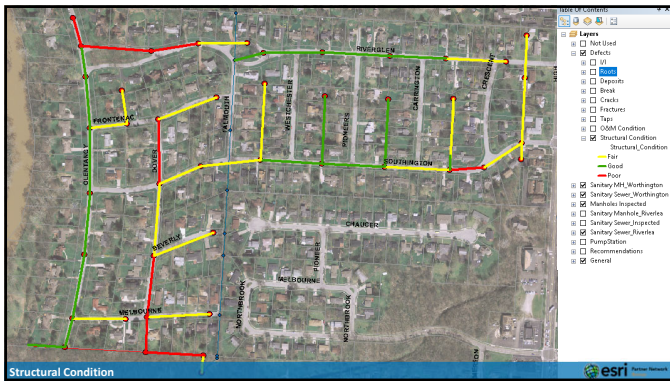
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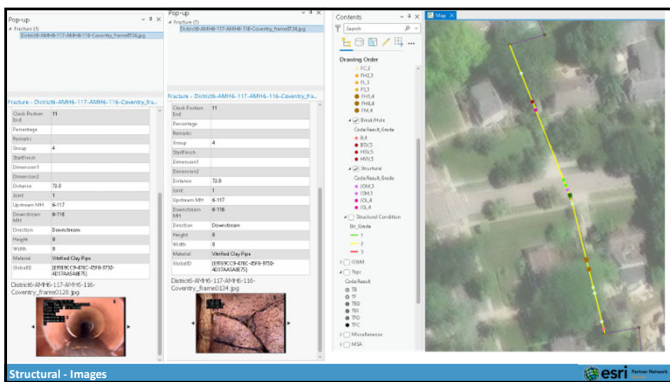
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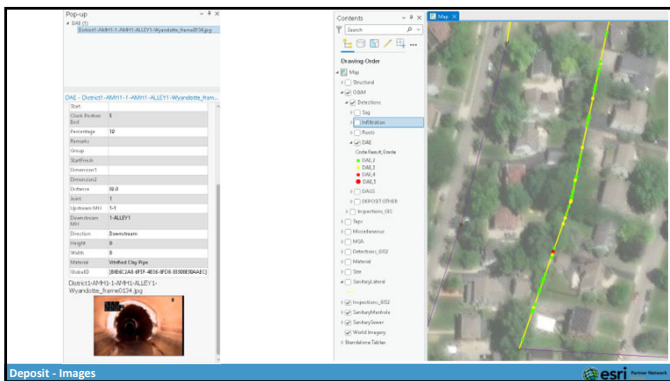




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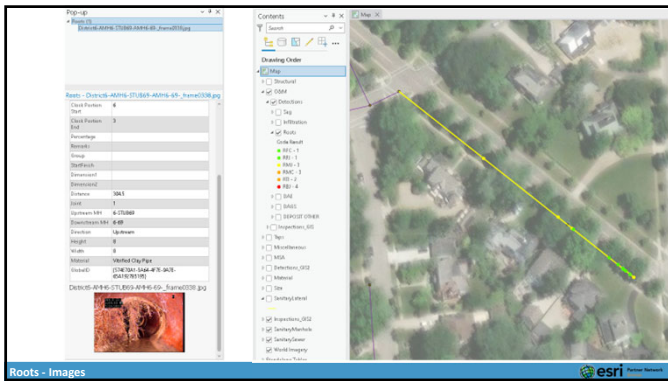


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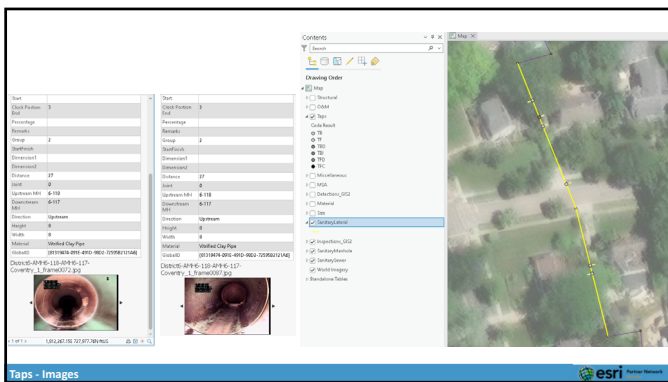


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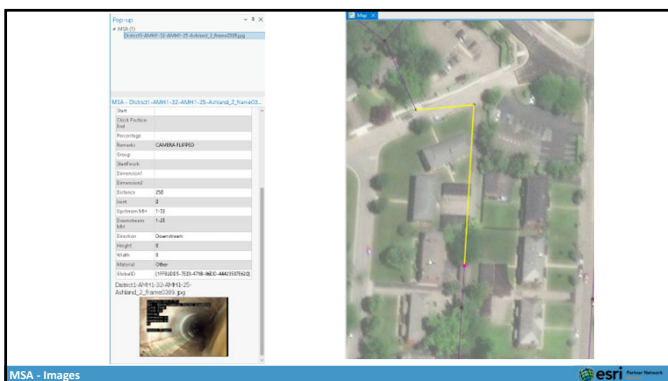




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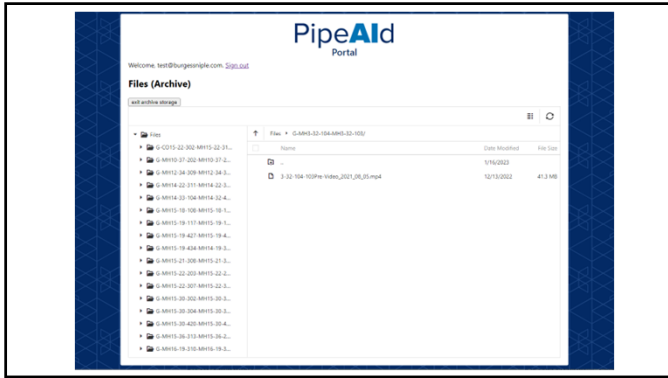


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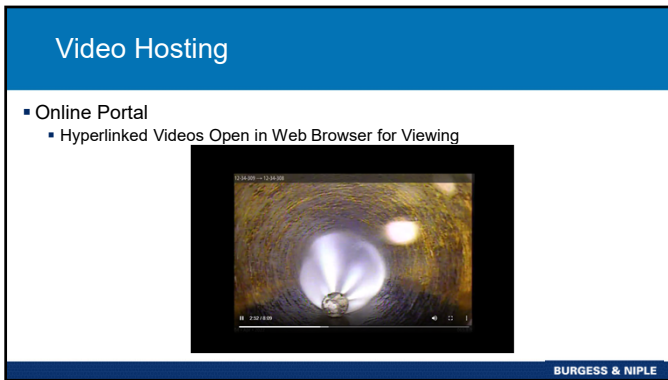
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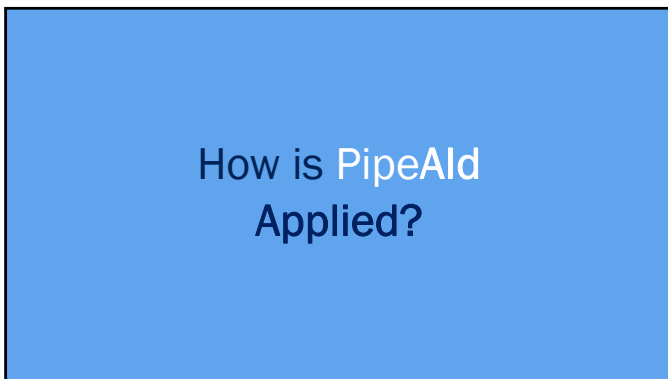
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### Intel in Ohio

- Announced 1/21/22
- \$20 Billion Investment
- 1,000-acre site
- 8 Fabs
  - First two in 2025

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### Intel in Ohio

- Intel only 10,000 people
- worldpopulationreview.com
  - 500 Ohio Cities/Villages
  - 78 with 5k-10k
  - 245 under 5k
  - Intel development > 65%
- Intel Suppliers
- Central Ohio +1M by 2050

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### Preparing for Growth

- CIP Development
  - Comprehensive Planning
  - Traffic Planning
  - Utility Planning
    - Condition Assessment



Project Management | Project Cost Origin | Current Status | BUN BUN Partner | BUN Partner Application | BUN BUN

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### Village Cleaning and Televising Project

- 114,000' of pipe
  - 8" to 36"
- Traditional Cleaning and Inspection
  - Central Ohio Area Average \$4/ft to \$8/ft
  - \$500,000+
- Phase out over two years



Project Management | Project Cost Origin | Current Status | BUN BUN Partner | BUN Partner Application | BUN BUN

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### Village Cleaning and Televising Project

- Intel will be here in 2025
- Time matters
  - Traditional method means 2024 (TOO LATE)
- Cost Matters
  - Construction to support growth (NOW)



Project Management | Project Cost Origin | Current Status | BUN BUN Partner | BUN Partner Application | BUN BUN

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### Cleaning and Televising Project

- Lower Cost and Reduce Time
- Contractor
  - Light Cleaning
  - Capture Video
  - Document Header Data
  - Look up laterals
  - Sufficiently document severe structural defects
- PipeAid
  - PACP Coding
  - Digital Twin

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### Cleaning and Televising Bid Prices

- Contractor 1 - \$1.54/ft to \$1.89/ft
- Contractor 2 - \$1.60/ft to \$5.97/ft
- Contractor 3 - \$1.76/ft to \$4.00/ft
- Contractor 4 - \$2.00/ft to \$3.00/ft
- Contractor 5 - \$3.00/ft - \$5.50/ft
- Contractor 6 - \$3.25/ft - \$7.00/ft
- Contractor 7 - \$4.50/ft to \$5.50/ft



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### Cleaning and Televising Project

- Contractor 7 ~ \$500,000
- Contractor 1 ~ \$200,000
- PipeAid added
  - \$0.25/ft for coding
  - \$0.10/ft digital twin
  - Total cost just under \$50,000
- Cost savings \$250,000
- Completed this year

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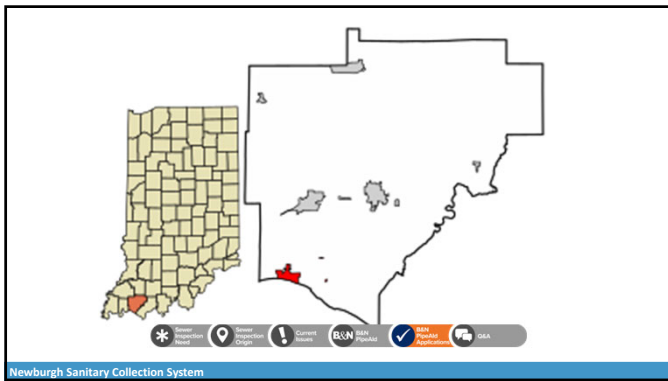
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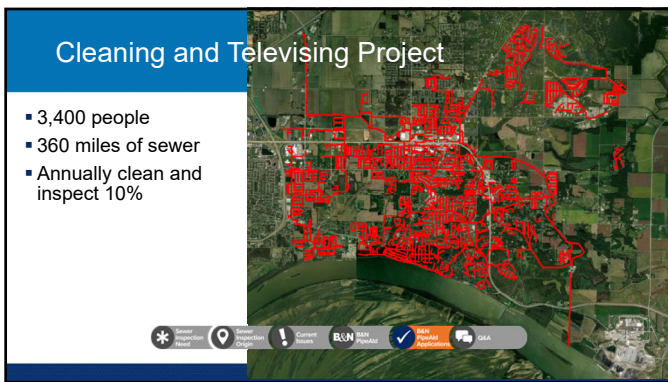
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Segment Reference	SDM Pipe Rating	SDM Pipe Rating Index	SDM Quick Rating	Structural Pipe Rating	Structural Pipe Rating Index	Structural Quick Rating	Overall Pipe Rating	Overall Pipe Rating Index	Overall Quick Rating	Deterioration
05-05C0	7	2.3	3111	2	2	2100	9	2.3	3111	Yellow
05-05C0	6	2	3008	2	2	2100	6	2	3008	Yellow
05-05C0	9	2.3	4111	2	2	2100	9	2.3	4111	Yellow
05-05C0	8	1.8	3111	2	2	2100	9	1.8	3111	Yellow
05-11	3	1	1000	2	2	2100	7	1.4	2111	Yellow
05-11	2	1	1000	2	2.3	3102	11	1.8	3111	Yellow
05-18	2	1	1000	5	3.5	3121	5	3.5	3121	Yellow
05-18	2	1	1000	5	3.5	3121	5	3.5	3121	Yellow
05-19	1	1	1000	11	3	3111	15	1.9	3111	Yellow
05-19	2	1	1000	11	3	3111	15	1.9	3111	Yellow
05-05D0	8	2.2	4111	2	2	2100	13	2.6	4111	Yellow
05-05D0	4	2	3111	2	2	2100	4	2	3111	Yellow
05-05a7	4	2	3111	2	2	2100	4	2	3111	Yellow
05-12	12	2.1	4124	22	2.2	4124	61	2.2	4124	Yellow
05-12	7	2.3	3111	2	2	2100	18	2.6	3111	Yellow
05-181	4	2	3111	2	2	2100	4	2	3111	Yellow
05-181	4	2	3111	2	2	2100	4	2	3111	Yellow
05-181	13	1	1400	20	2.5	4121	22	1.4	4121	Yellow
05-10	9	1.3	3118	5	3.5	3121	24	3.7	3121	Yellow
05-11	5	2	3111	5	3.5	3121	12	3	3111	Yellow
05-11	18	1.3	3124	22	2	2100	20	1.3	3121	Yellow
05-16	11	1.9	3118	9	3.3	3111	18	2	3124	Yellow
05-16	19	2.5	4118	9	3	3100	46	2.4	4118	Yellow
05-17	2	1	1000	9	3	4121	11	2.2	4111	Yellow
05-17	1	1	1000	2	2	2100	3	1.5	2111	Yellow
05-19	10	2	3111	14	3.5	3141	28	3.5	3141	Yellow
05-19	10	2	3111	14	3.5	3141	28	3.5	3141	Yellow
05-20	11	1.9	3118	11	3	3111	17	2.4	3124	Yellow
05-20	10	2.1	4124	5	2.5	3111	17	2.1	4121	Yellow
05-111	11	1.8	3118	6	3.2	4121	29	1.8	4121	Yellow
05-111	11	1.7	3124	20	2.8	4121	41	2	4124	Yellow
05-112	4	1	1000	14	3.8	4121	12	1.8	4124	Yellow
05-112	13	1.9	3111	22	2.2	3124	51	2.3	4121	Yellow
05-115	17	2.1	3111	10	3	3111	31	3.1	3111	Yellow
05-115	6	1.5	3111	11	2.2	3111	31	1.5	3111	Yellow

Deterioration

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Segment Reference	SDM Pipe Rating	SDM Pipe Rating Index	SDM Quick Rating	Structural Pipe Rating	Structural Pipe Rating Index	Structural Quick Rating	Overall Pipe Rating	Overall Pipe Rating Index	Overall Quick Rating	Deterioration
109 36	35	2.1	3128	40	2	2020	21	2.1	3127	Worse
109 38	2	1.8	1000	9	3	4321	47	2.1	4311	Same
109 39	2	1.8	1000	7	3.5	4321	37	2.1	4312	Same
109 39	33	1.8	1000	2	3.5	4321	26	2.2	4318	Worse
109 31	41	2	4234	6	2	1321	27	2	4234	Worse
109 31	38	1.4	3123	35	3.2	4321	36	1.6	3125	Worse
109 38	30	1.3	1011	20	3.4	4321	48	1.6	1013	Worse
109 38	26	1.4	3021	7	3.5	5321	45	3.7	5333	Worse
109 47	6	3	4121	27	1.4	4321	19	1.4	4322	Same
109 47	31	2.1	3120	17	3.4	4321	37	2.5	4332	Worse
109 49V	30	1.2	4322	1	2	2220	12	2	4322	Worse
109 49V	42	2.2	4321	2	2	2220	56	2.2	4321	Worse
109 99	9	1.2	4322	1	2	2220	11	1.7	3122	Worse
109 99	12	2	2000	30	2.5	4321	22	2.2	4320	Worse
109 100	-	-	-	-	-	-	-	-	-	Same
109 100C	-	-	-	-	-	-	-	-	-	Same
109 112	37	2.2	1343	9	4.5	5341	20	2.9	3405	Worse
109 112	48	2.2	4313	9	4.5	2221	24	1.5	3424	Worse
109 216	8	2	2000	9	4.5	5341	21	3	3421	Worse
109 216	2	2	2000	-	-	-	2	2	2000	Worse
109 216	4	1	1000	-	-	-	1	1	1000	Worse
109 219	31	1.6	3811	1	1	1000	26	1.6	2416	Worse
109 51	2	2	2000	-	-	-	2	2	2000	Worse
109 51	2	2	2000	-	-	-	2	2	2000	Worse
109 51	5	1.2	2014	5	2.5	4220	24	2	2005	Worse
109 55	1	1	1000	4	4	4200	7	2.3	4312	Worse
109 56	2	2	2000	4	2	2200	14	2	2000	Worse
109 56	2	2	2000	2	2	2200	3	3	4312	Worse
109 57	2	2	2000	2	2	2200	4	2	2000	Worse
109 57	8	2	3021	8	2.7	3021	8	2.7	3021	Worse
109 58	3	2	2000	38	3.7	5341	30	3	3341	Worse
109 58	2	2	2000	38	3.7	5341	30	3	3341	Worse
109 81	18	2.4	4024	5	2.5	3221	45	2.4	3724	Worse
109 81	12	2.5	4234	4	1	1000	40	2.5	4234	Worse

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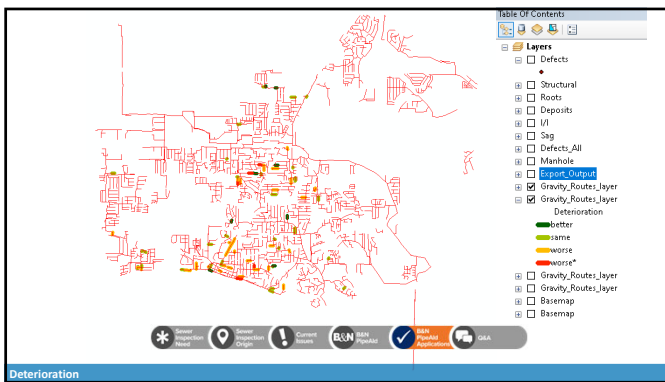
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**What AI Does for the Village**

**Time Savings**

**Cost Savings**

**Reliable Dataset**

**Repeatable Results**  
(decay rate)

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Questions?



**JOSH FORD, PE, PACP**  
Project Manager  
joshua.ford@bntelligence.com  
614.459.2050 x 1242



Project Manager | Project Cost Control | Current Issues | B&N | Risk Planning | Risk Register Applications | GMA

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