



WORLD WIDE WATER



MTA PIPE-INSPECTOR®

CABLE-LESS VIDEO INSPECTION WITH INTEGRATED LEAK DETECTION



MTA Messtechnik GmbH

Service & Products for Water and Wastewater Management,
Industry and Environmental Engineering



INSPECTION OF TRANSPORT AND DISTRIBUTION NETWORKS THE LIMITS TODAY

- cable length – tethered video systems
- no optical control – acoustic inspection
- operational interruptions
- limited accessibility





ACCESSIBILITY

- Airports
- High traffic locations
- Industrial zones
- Restricted areas





MAINTENANCE AND INSPECTION LEGAL OBLIGATION

- mainly based on pipeline age
- lifetime approx. 50 years
- necessary renewal rate approx. 2%

Current Situation

- 40% of the laid pipes are older than 60 years
- maintenance and servicing without knowledge of pipeline condition





INFLUENCES ON PIPES AND THEIR LIFETIME

- pipe pressure
- pressure changes
- flow rate
- water parameters
- sediments
- soil condition
- material-specific ageing
- traffic loads





THE REPAIR OPTION

- short-term solution
- only punctual repair
- no long-term measure

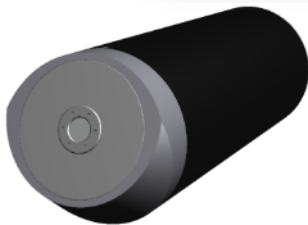




WORLD WIDE WATER



MTA PIPE-INSPECTOR® MODELS FOR DN 100 – 3000 | 4“ – 120“



Gravity



Pressure



MTA PIPE-INSPECTOR® PRESSURE APPLICATIONS

max. 100bar, optimal flow velocity: 0.5-1.5m/s

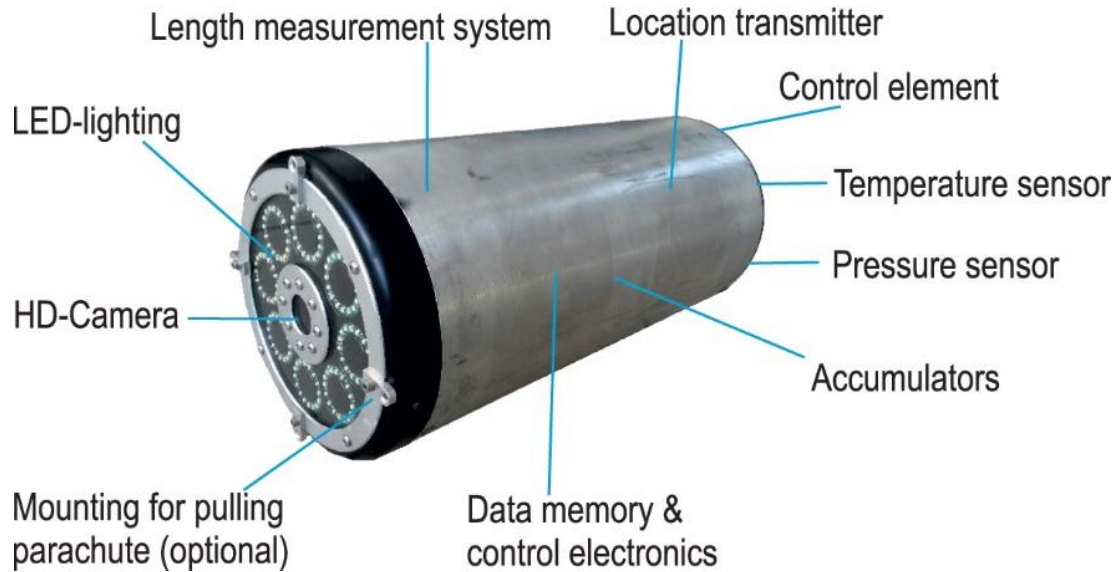
optical and acoustic sensors, pressure, temperature and length measurement, locating signal, internal power supply

Model	Application	Runtime approx.
PI DN 65mm 2,5"	DN 100 - 250 4" - 10"	3h - 8h
PI DN 125mm 5"	DN 250 - 600 10" - 24"	6h - 10h
PI DN 225mm 9"	DN 400 - 1200 16" - 47"	8h - 35h
PI DN 400mm 16"	DN 600 - 1800 24" - 70"	12h - 35h
PI DN 800mm 32"	DN 1500 - 3000 60" - 120"	14h - 35h



MTA PIPE-INSPECTOR® PRESSURE

APPLICATIONS FEATURES

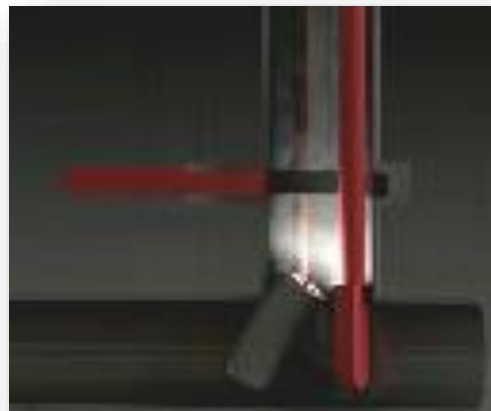


- Video inspection
- Acoustic leak detection
- location of air pockets
- length measurement
- up to 100bar operational pressure
- battery mode
- self floating
- centering in the pipe
- 90° bend capable
- locating signal (32,8kHz or 512Hz)
- USB interface



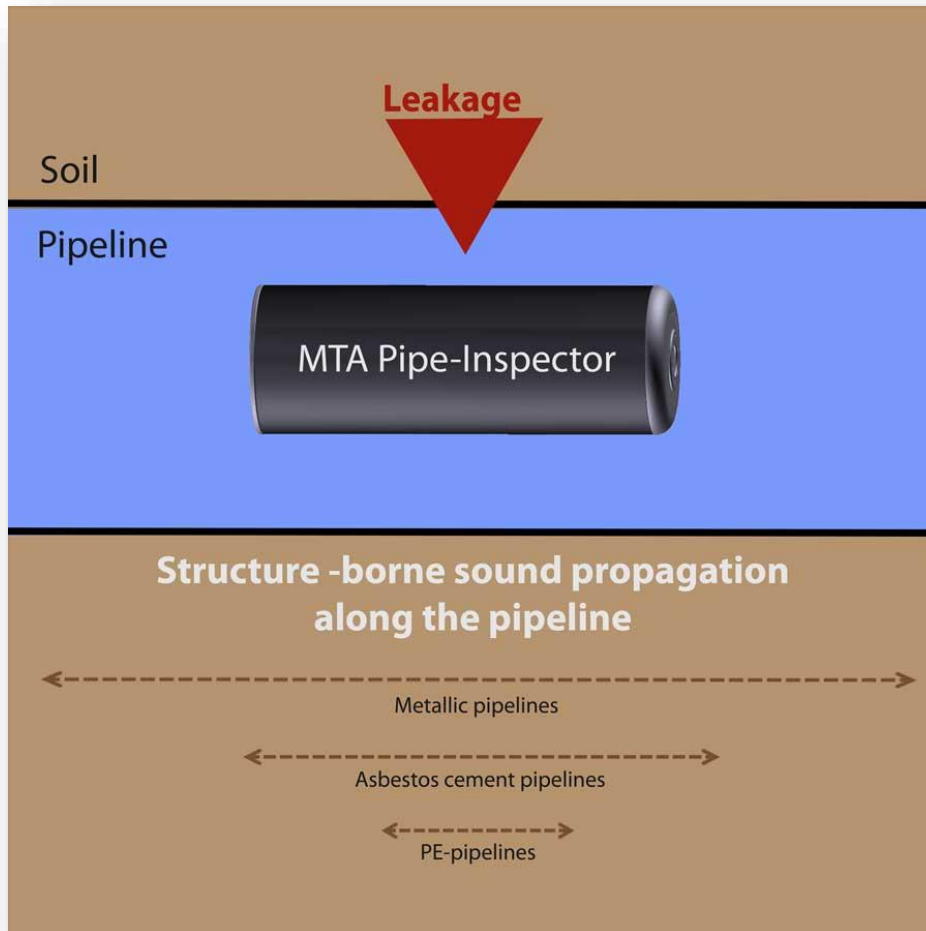
MTA PIPE-INSPECTOR® LAUNCH AND RETRIEVAL

- via existing fittings, pigging station,
- by means of MTA insertion sluice
 - insertion piston
 - insertion sluice
 - T-piece with valve
 - retrieval rescue net
 - retrieval sluice



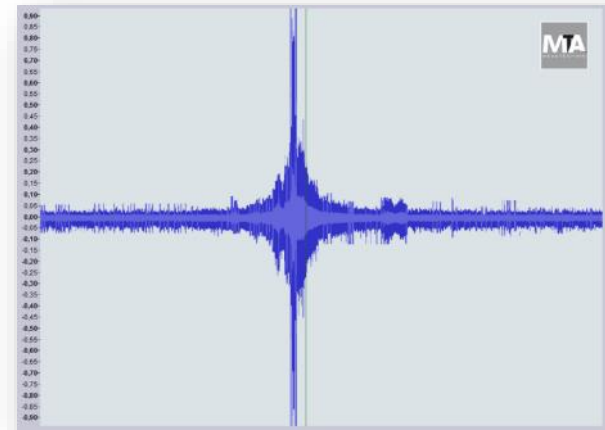


ACOUSTIC LEAK DETECTION



pinpointing micro leakages

steel pipes approx. > 1l/h at 5bar/72PSI
PE approx. 5l/h at 5bar/72PSI



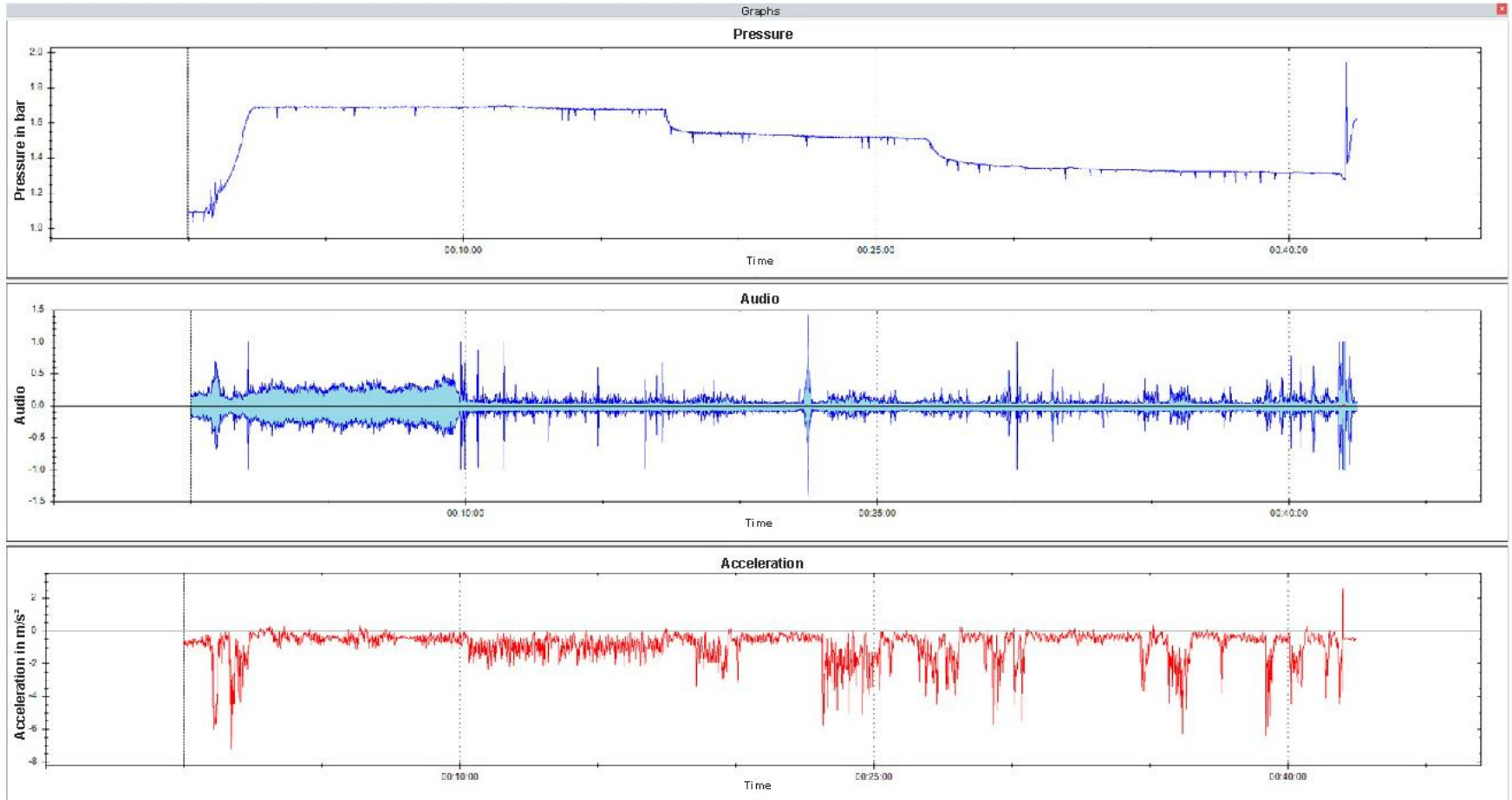


DAMAGE DETERMINATION

The screenshot displays the MTA Pipe Inspector software interface. On the left, a video feed shows a pipe interior with a length of 2673,80m. Below the video are playback controls and tabs for 'Temperatur', 'Druck', 'Audio', and 'Beschleunigung'. The 'Temperatur' tab is active, showing a graph of temperature over distance. The right side of the interface features three stacked graphs: 'Temperatur' (red line), 'Audio' (blue waveform), and 'Beschleunigung' (red waveform). At the bottom right, a circular control panel with 12 numbered buttons (01-12) is visible, along with '12 Stunden', 'Abbrechen', and 'OK' buttons.



RESULTS AS DIAGRAMS





INSPECTION PROTOCOL | EXAMPLE

MTA Pipe-Inspector® - Video Inspection				
Date: 05.04.2017		Operator: MTA-Messtechnik	Weather: Dry	Report No.: 201704002
Pipeline Type Circular Profile	Pipe Inspector: 1512002	Cleaning: No		Page 1/1
Place	Section			
Post Code	Start Point			
Street	End Point			
Area	Section Length [m]	3179m		
Inspection Purpose Medium	Leakage Potable Water	Profile Material	DN 300 Grey cast iron	
Position	Code	Observation	MPEG	Picture
[m]				
0.00 m		Start point	00:00:00	PI_001.jpg
827 m		Branch	00:24:08	PI_002.jpg
1 663 m		Begin - Air Pocket	00:48:31	PI_003.jpg
1 691 m		End - Air Pocket	00:49:20	PI_004.jpg
2 001 m		Leakage	00:58:23	PI_005.jpg
3 179 m		End point	01:32:46	PI_006.jpg
Annotations:				
The turbidity was measured during the inspection continuously at the end point (nearby hydrant). The maximum value did not exceed 2FNU.				



INSPECTION RESULTS

- all relevant data on pipe condition
- decision base for strategic maintenance, servicing and renovation
- basic data for risk assessment, determination of consequential costs and economic losses





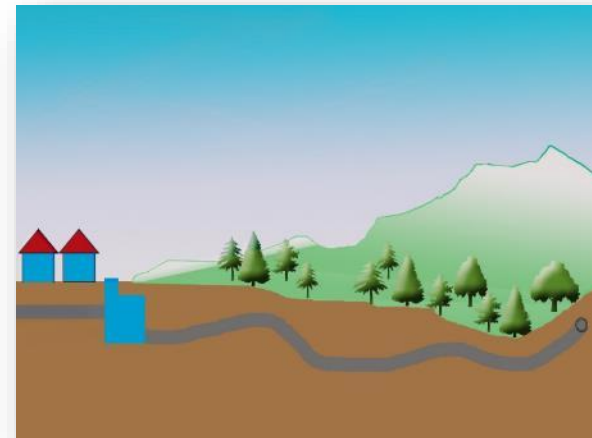
MTA PIPE-INSPECTOR® SCOPE

	MTA Pipe-Inspector®	Untethered Acoustic Devices	Tethered Video Cameras	Cameras with Parachute
Type of inspection	cable-less	cable-less	wired	wired
Application				
Potable water	✓	✓	-	✓
Wastewater pressure	✓	✓	-	✓
Wastewater open channel	✓	-	✓	-
Hydropower	✓	✓	-	✓
Gas	✓	?	-	-
Oil	✓	?	-	-
District heating	✓	✓	-	✓
Recording				
Video inspection	✓	-	✓	✓
Leakage detection	✓ (>1l/h)	✓	-	✓
Air pockets	✓ (optical)	-	✓	-
Integrated length measurement	✓	-	✓	✓
Pressure measurement	✓	-	-	-
Temperature measurement	✓	-	✓	-
Pipeline profile	✓	-	-	-
Detection signal	✓	-	✓	-
Pipe diameter DN				
DN min.	DN100 / 4"	DN100 / 4"	DN100 / 4"	DN100 / 4"
DN max.	DN3000 / 120"	?	DN3000 / 120"	DN1000 / 40"
Inspection length max.	50km / 30mi	10km / 6.2mi	0,5km / 0.3mi	2km / 1.2mi
Bend capable up to	90°	90°	-	maximum 1 bend
Pressure class	up to 100bar / 1.450PSI	?	1bar / 14.5 PSI	10bar / 145PSI
Certificate for potable water	✓	?	-	?



MTA PIPE-INSPECTOR® BENEFITS

- optical state determination and acoustic leak detection
- raw and drinking water, wastewater, hydropower, industry, gas and oil pipelines
- inspection lengths up to ~50km / 30mi in a single pass
- for all pipe materials
- 90° bend capable
- no excavations
- no operational interruptions
- foreign water identification
- peak and air pocket identification
- state development monitoring by repeated inspections





PROJECT EXAMPLES



DRINKING WATER MAIN, THE NETHERLANDS

LEAK DETECTION

- pipeline DN 700 | 28“
- length 3,260m | 2mi
- material reinforced concrete
- equipment MTA PIPE-INSPECTOR
PW DN 225P
length 470mm | 18”





DRINKING WATER MAIN, THE NETHERLANDS





WASTEWATER MAIN, AUSTRIA, LAKE WÖRTHERSEE

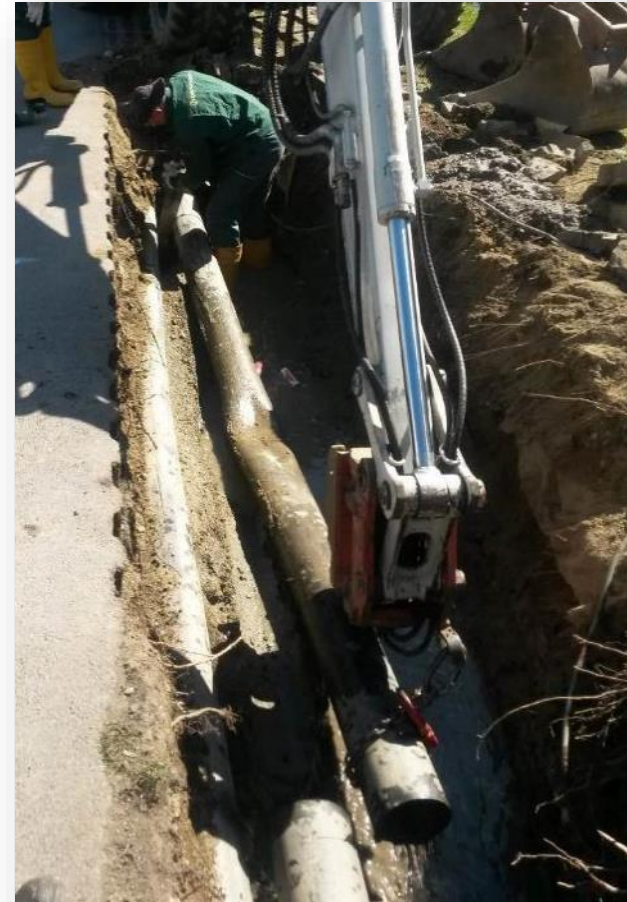
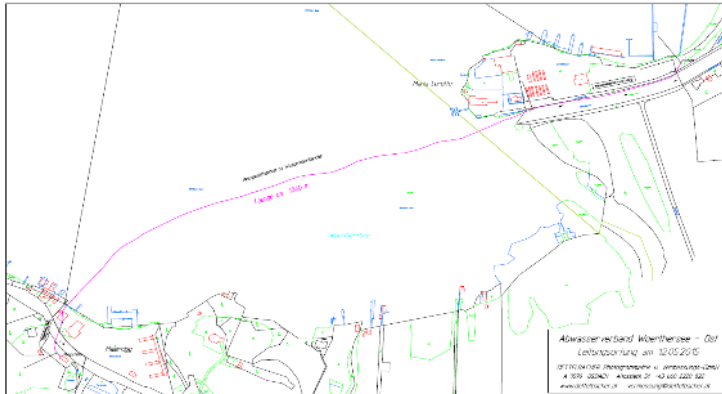
Pipeline detection | Optical inspection | Leak detection

- pipeline DN 200 | 8“
- length 1,040m | 3,412ft
- material PE-HD
- laying depth 27m | 90ft
- equipment MTA PIPE-INSPECTOR
WW DN 65P
length 195mm | 8“
Pressure class PN32 | 465psi





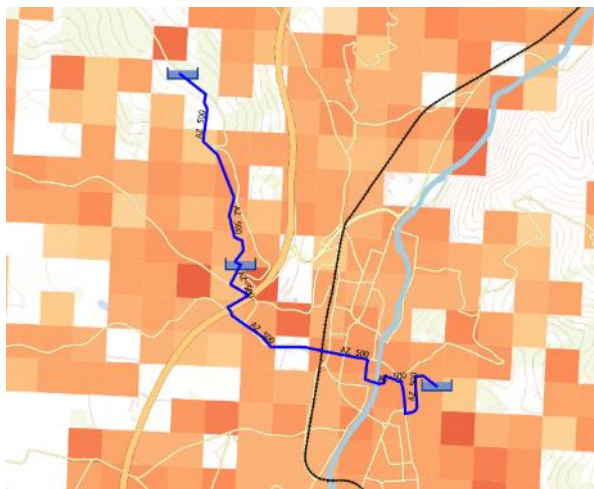
WASTEWATER MAIN, AUSTRIA, LAKE WÖRTHERSEE



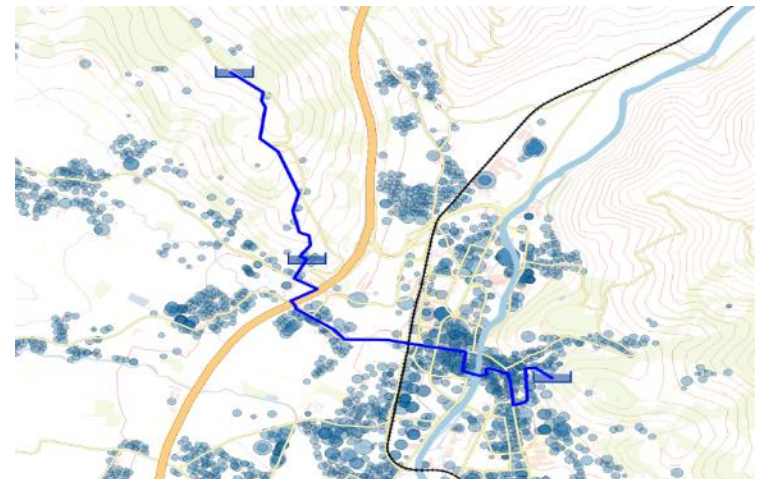
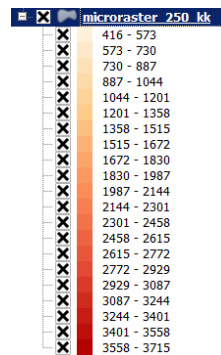


RISK MANAGEMENT

- trend towards a state-oriented renewal strategy
- implementation in urban planning
- including business and economic aspects
- important components of urban planning risk management



Purchase power



Water consumption/year



PIPE BURST IN MELBOURNE

- subsequent costs
- danger to life
- liability





STEAM PIPE EXPLOSION IN NEW YORK CITY



Crossroad Lexington Avenue and 41th Street



WORLD WIDE WATER



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