# The Importance of Water Conservation Measurement

CITY OF CAPE TOWN | ISIXEKO SASEKAPA | STAD KAAPSTAD

THIS CITY WORKS FOR YOU

## Water Demand Management & Strategy
## Water and Sanitation
## Presented By: Nina Viljoen

**Date: 23 August 2013**

CITY OF CAPE TOWN | ISIXEKO SASEKAPA | STAD KAAPSTAD

THIS CITY WORKS FOR YOU

***"Measurement is the first step that leads to control and eventually to improvement. If you can't measure something, you can't understand it. If you can't understand it, you can't improve it.“***

**- H. James Harrington**

# Introduction

CITY OF CAPE TOWN | ISIXEKO SASEKAPA | STAD KAAPSTAD

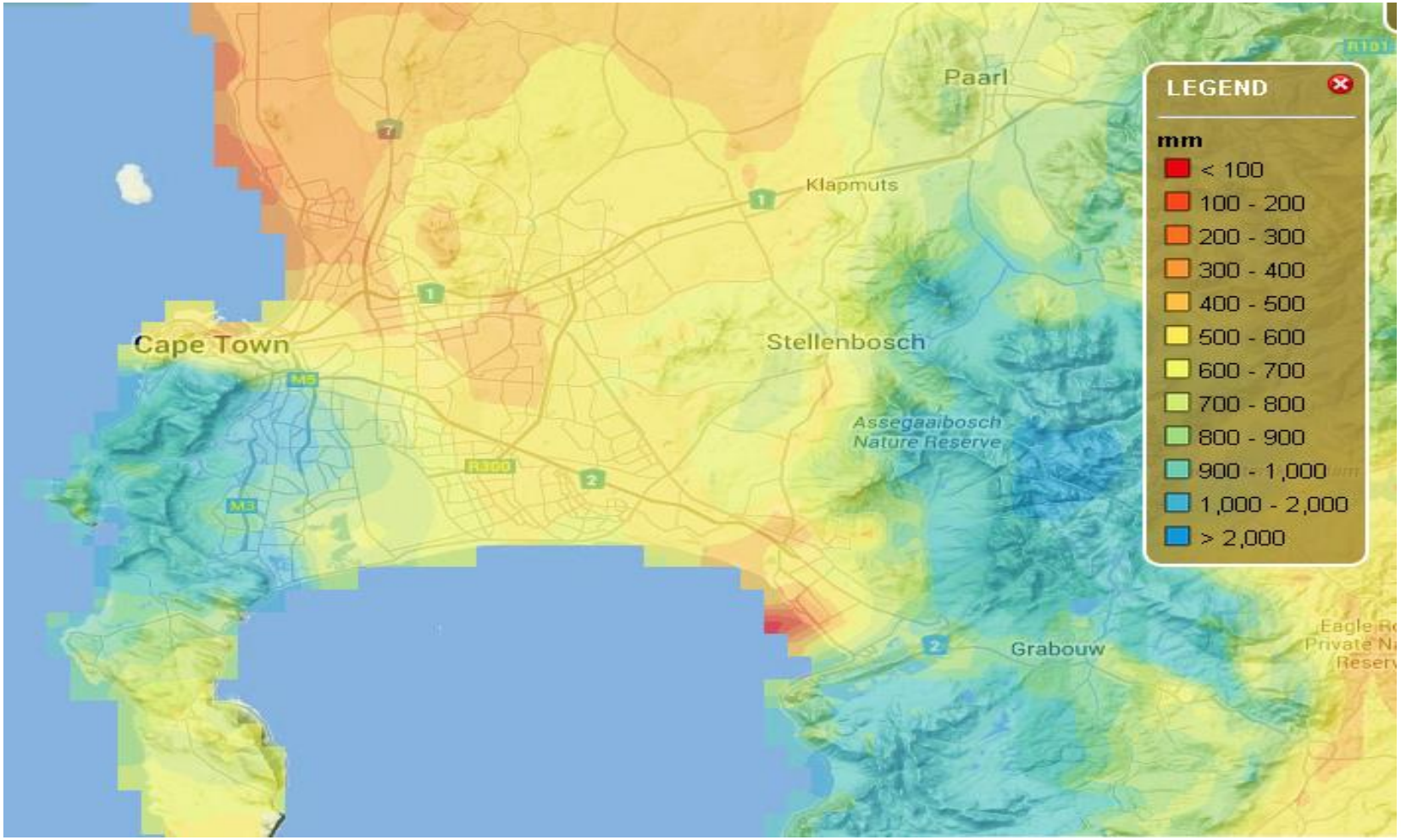
THIS CITY WORKS FOR YOU

- Cape Town  is receiving low volumes of rainfall (average of 500 mm per annum).
- High evaporation occurs (approx. 85%  of mean annual precipitation).
- Highly variable and spatial distribution of rainfall.
- Stream flows in most rivers are at relatively low levels for most of the year,
- Infrequent high flows that do occur happen over limited and often unpredictable periods.

# Cape Town's Rainfall Figures

CITY OF CAPE TOWN | ISIXEKO SASEKAPA | STAD KAAPSTAD

THIS CITY WORKS FOR YOU



# Introduction (cont.)

CITY OF CAPE TOWN | ISIXEKO SASEKAPA | STAD KAAPSTAD

THIS CITY WORKS FOR YOU

- The City of Cape Town established a dedicated Water Demand Management Branch in 2007.
- This Branch consists mainly of two sections:
  - A technical section;
  - A Water Conservation and social awareness section.
- The role of the Water Conservation and social awareness section is to raise awareness about Water Conservation and influence behaviour change through the education of consumers.
- Aim is to increase knowledge levels about water saving.

# Measuring the Impact of Water Conservation Initiatives

CITY OF CAPE TOWN | ISIXEKO SASEKAPA | STAD KAAPSTAD

THIS CITY WORKS FOR YOU

- It is imperative that awareness and education activities and interventions are implemented in order to ensure water is used efficiently and wastage is minimised.
- The effectiveness of any awareness campaign is ultimately measured by the results of the implemented measures.
- It is however very difficult to assess the impact on behaviour change.
- It is therefore essential to look at measuring techniques in order to assess conservation initiative impact and successes.

# The Difference Between Raw and Analysed Data

CITY OF CAPE TOWN | ISIXEKO SASEKAPA | STAD KAAPSTAD

THIS CITY WORKS FOR YOU

- Raw data refers to all collected statistics, opinions, facts or forecasts which have not been analysed.
- Analysed data refers to the results of  the collected data via different techniques for future decision making.
- By analysing data we can receive valuable information and predictions.

# The Purpose of Gathering Information


- Information collecting can help to:
  - Measure basic attitudes of groups.
  - Measure the true opinions of various groups.
  - Improve campaign/project effectiveness.
  - Pre-test messages and proposed communication channels.
  - Achieving two-way communication.
  - Reveal problem areas before they develop into crisis.
  - Identify current public interests and concerns.
  - Achieve credibility.

# Selecting a Successful Measurement Program


- Steps that should be followed to complete a successful measurement program:
  - Deciding on what need to be assessed.
  - Selection of an evaluation design to fit the program.
  - Choosing the methods of measurement.
  - Deciding on the target audience and sample areas/sizes
  - Determining when to conduct the assessment.
  - Gather, analyze, and interpret the data in visual form.

# Measuring Techniques

CITY OF CAPE TOWN | ISIXEKO SASEKAPA | STAD KAAPSTAD

THIS CITY WORKS FOR YOU

- The two major types of measuring techniques used by the City are:
  - Survey questionnaires: Pre-and post interventions
    - Comparison of before and after results
    - Analysis of change in perceptions/attitudes in order to assess campaign impact
  - Water Consumption: Pre-and post interventions
    - Six month before and after
    - Long term historic and current trend comparison

# Conservation Measurement by Surveying

CITY OF CAPE TOWN | ISIXEKO SASEKAPA | STAD KAAPSTAD

THIS CITY WORKS FOR YOU

# The Basic Survey - Assessment of Knowledge and Attitudes

CITY OF CAPE TOWN | ISIXEKO SASEKAPA | STAD KAAPSTAD

THIS CITY WORKS FOR YOU

- The fundamental principles of survey research are:
  - To use it in a scientific way at a reasonable cost
  - To realise benefits of interviewing a representative sample instead of an entire population.
- Survey research can provide valuable information on:
  - Knowledge, attitude and behaviour before & after an intervention
  - Community demographics
  - Preferred or most suitable educational material
  - Political or other challenges affecting the initiative
- The results can provide information on the level of effectiveness.

# Measuring the Impact of Water Conservation Initiatives (cont.)

CITY OF CAPE TOWN | ISIXEKO SASEKAPA | STAD KAAPSTAD

THIS CITY WORKS FOR YOU

- Water Conservation measurement can:
  - Facilitate the initiation of water conservation interventions.
  - Help identify possible reasons for high consumption.
  - Help initiate the development of education media focusing on high consumption suburbs.
  - Help identify residential high consumptive categories.
  - Enables the quantification of results to show success.
  - Facilitates the adjustment of the campaign direction.
  - Provide the City with a water consumption referencing system.

# Types of Surveying

CITY OF CAPE TOWN | ISIXEKO SASEKAPA | STAD KAAPSTAD

THIS CITY WORKS FOR YOU

- Various types of surveys can be used in Water Conservation measurement:
  - Mail surveys
  - Telephonic surveys
  - Door-to-door surveys
  - On-line surveys
- The City's Water Conservation Section mostly uses the door-to-door method.
- In challenging conditions a combination of survey methods can be used.

# Survey Layout and Design

CITY OF CAPE TOWN | ISIXEKO SASEKAPA | STAD KAAPSTAD

THIS CITY WORKS FOR YOU

- According to the Statistics Act: 1999 and the Law Reform Act 19:1973 (Privacy and data protection);
  - A declaration of confidentiality must be included in written form on a survey sheet.
  - A separate declaration of confidentiality sheet must be provided for the respondents signature.
  - Avoid too long or many questions.
  - Use close-ended questions rather than open-ended.
  - Keep to the topic or relevance of the survey

# The Basic Survey Sheet Outlay

Declaration of Confidentiality

Question Area

Tick Box Area

Additional Comments Area

Official Use Area

## KEEP SAVING WATER

(Sub-council 4: Water Saving Survey)

Suburb: _____

THIS CITY WORKS FOR YOU

CITY OF CAPE TOWN | ISIXEKO SASEKAPA | STAD KAAPSTAD

THIS CITY WORKS FOR YOU

**Declaration of Confidentiality**

We would like to request a few minutes of your time to assist in this water saving research. This survey is investigating the knowledge levels of the public on the saving of water . Your participation is voluntarily and your personal details are not required. Your answers will be treated as confidential.

| NO. | QUESTIONS | ANSWERS | |
|---|---|---|---|
| | | *Please Tick √* | |
| 1 | | Yes ☐ | No ☐ |
| 2 | | ☐ | ☐ |
| 3 | | ☐ | ☐ |
| 4 | | ☐ | ☐ |
| 5 | | ☐ | ☐ |
| 6 | | ☐ | ☐ |
| 7 | | ☐ | ☐ |
| 8 | | ☐ | ☐ |

13 **ADDITIONAL COMMENTS:**

**For Official Use**

Household ☐
Shopping Centre ☐
Library ☐
Clinic ☐
Business ☐

Low Income (RDP, Informal) ☐
Middle Income ☐
High Income ☐

Officer Name: _____

Date: _____

Other: _____

# Participation Consent

CITY OF CAPE TOWN | ISIXEKO SASEKAPA | STAD KAAPSTAD

THIS CITY WORKS FOR YOU

## CONSENT

### WATER CONSERVATION SURVEY

Date...../...../20...

**NATURE AND PURPOSE OF THE SURVEY**

.....

.....

**SURVEY RESEARCH PROCESS**

- Interviews and the completion of questionnaires will be conducted.
- The interviews and questionnaires will take approximately 5 minutes of your time.
- The five minute interview will be conducted in order to enhance and support the questionnaire results.
- Participation is voluntary and no personal details are required.

**CONFIDENTIALITY**

The information you provide will be treated as highly confidential. If water account or any other related information is voluntarily released by participants during interviews it will be treated as highly confidential and any documents will be destroyed after completion of this research study.

**WITHDRAWAL CLAUSE**

I understand that may I may withdraw from this survey at any time. I therefore participate voluntarily until such time as I request otherwise.

**INFORMATION (contact information of Water Conservation Official))**

If you have any further questions, you may contact the Water Conservation Official..... at.....

**CONSENT**

I, the undersigned, .....(full name) have read the above information relating to the survey and declare that I understand it. I hereby declare that I agree voluntarily to participate in the survey. I further undertake to make no claim against the City of Cape Town in respect of damages to my person or reputation that may be incurred as a result of the survey initiative or through the fault of other participants.

Signed at ..... on .....

Signature of participant: .....

# The Benefits of Surveying

CITY OF CAPE TOWN | ISIXEKO SASEKAPA | STAD KAAPSTAD

THIS CITY WORKS FOR YOU

- Assesses effectiveness of campaign strategy.
- Assesses current knowledge, attitudes and perception levels.
- Provides information on social benefits.
- One on one opportunity to engage with community.
- Opportunity for discussion and sharing information.
- Gathering of area and community information.
- Testing of new material and ideas.
- Promoting team work and spirit.

# Water Consumption Measurement

CITY OF CAPE TOWN | ISIXEKO SASEKAPA | STAD KAAPSTAD

THIS CITY WORKS FOR YOU

# Water Consumption Measurement

CITY OF CAPE TOWN | ISIXEKO SASEKAPA | STAD KAAPSTAD

THIS CITY WORKS FOR YOU

- Pre-and post intervention water consumption measurement provides information on:
  - Historic water consumption trends.
  - The level of change after intervention.
  - The identification of high consumption areas.
  - Effective monitoring and reporting.
- Enables understanding of residential water-usage behavior patterns.
- Facilitates assessment of impact of patterns on water demand management.
- Provides data that can be correlated with future trends.
- Supports demand forecasting.

# Water Consumption Assessment Methodology

CITY OF CAPE TOWN | ISIXEKO SASEKAPA | STAD KAAPSTAD

THIS CITY WORKS FOR YOU

- Consumption information drawn from municipal data management system.
- Corruptive and single, extraordinary high consumption entries ignored.
- Ignored data saved separately for further analysis.
- Equal sample sizes per suburb are statistically assessed.
- Average monthly or daily water consumptions drawn and analysed.
- Assessment of water consumption totals per suburb very time consuming.

# The Importance of Visual Graphs and Tables

CITY OF CAPE TOWN | ISIXEKO SASEKAPA | STAD KAAPSTAD

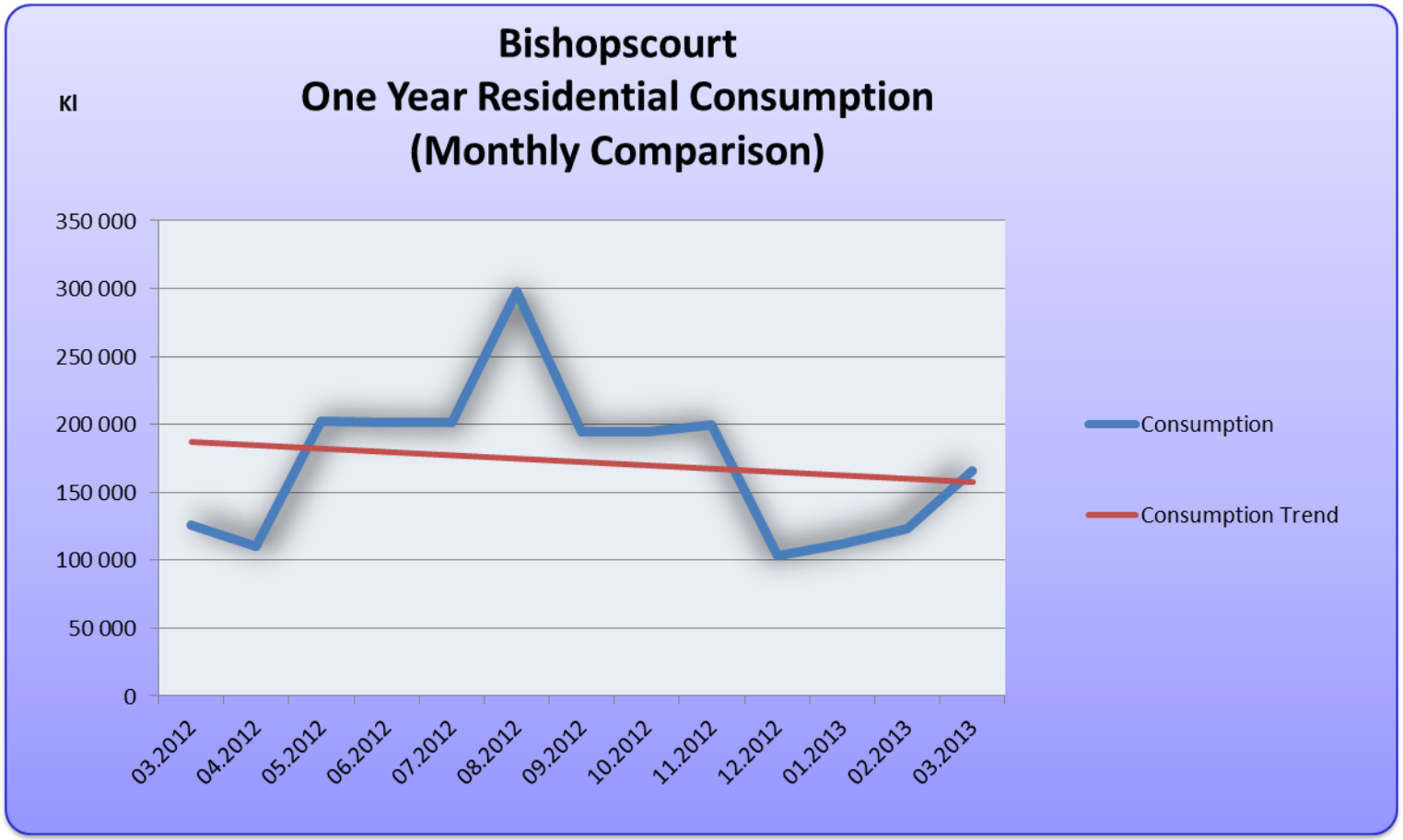
THIS CITY WORKS FOR YOU

- Graphs and tables represents the results visually in order for:
  - The information to become clear and understandable.
  - Any trends to be highlighted.
  - The saving of valuable time.
  - Campaign/project strategies to be easily monitored.
  - It allows for quick and effective corrective measures.

# Example of Analysed Data Results Portrayed in Visual Graph Form

CITY OF CAPE TOWN | ISIXEKO SASEKAPA | STAD KAAPSTAD

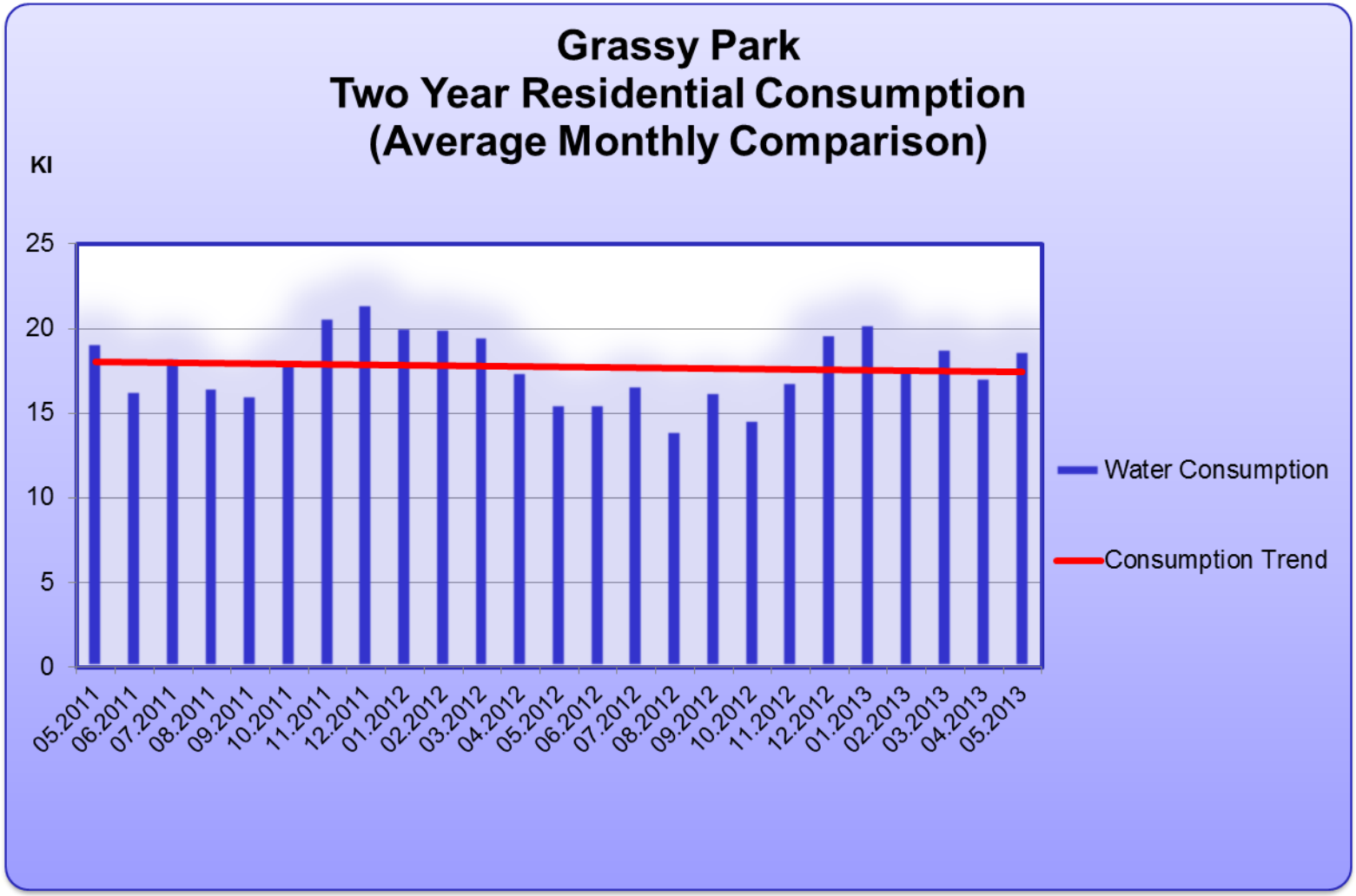
THIS CITY WORKS FOR YOU



# Example of Analysed Data Results Portrayed in Visual Graph Form (Cont.)

CITY OF CAPE TOWN | ISIXEKO SASEKAPA | STAD KAAPSTAD

THIS CITY WORKS FOR YOU



# Example of Analysed Data Results Portrayed in Visual Table Form

CITY OF CAPE TOWN | ISIXEKO SASEKAPA | STAD KAAPSTAD

THIS CITY WORKS FOR YOU

## Elsiesriver

**Daily Average Consumption Categories**
***(Simple Random Sample of 100 Properties)***

| Consumption Category (Kl) | Number of Properties | |
|---|---|---|
| 0.100 - 0.500 | 38 | |
| 0.501 - 0.999 | 42 | |
| 1.000 - 1.999 | 13 | 20% |
| 2.000 - 2.999 | 2 | |
| 3.000 - 3.999 | 2 | |
| >4.000 | 3 | |

# Sampling Methods

CITY OF CAPE TOWN | ISIXEKO SASEKAPA | STAD KAAPSTAD

THIS CITY WORKS FOR YOU

- Two main sampling methods can be used:
  - Probability (random) sampling where:
    - Each unit of the population has equal chance of being included.
  - Non-probability sampling where:
    - Judgement of researcher influences the selection of sample units.
- The bigger the sample the more statistically valid are the results.
- Sample estimate should be assessed at confidence level that will provide good estimation that it is within the true population value.

# Some Key Findings: Consumption Analysis

CITY OF CAPE TOWN | ISIXEKO SASEKAPA | STAD KAAPSTAD

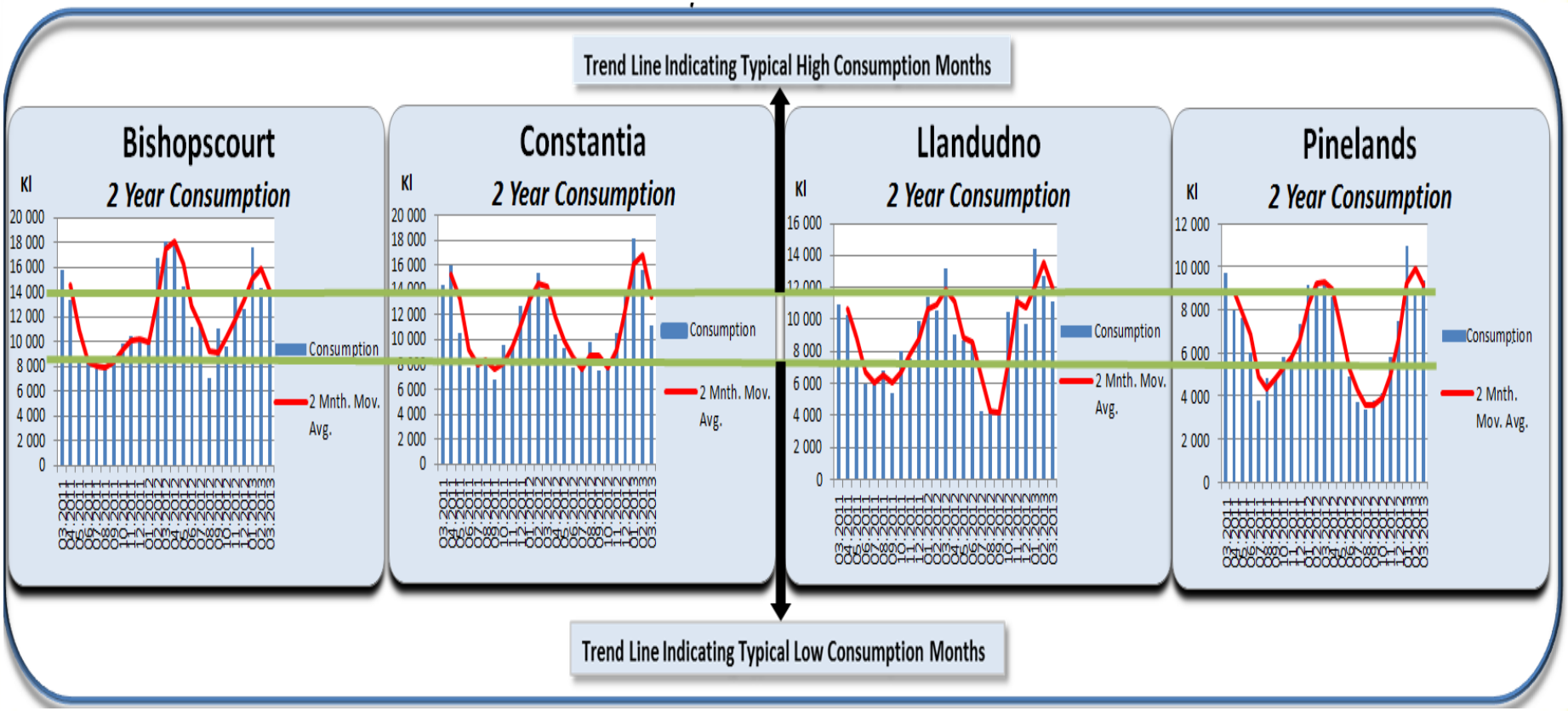
THIS CITY WORKS FOR YOU

- Clear seasonal consumption patterns.
- Assumptions of the potential impact of climate change and related rainfall changes:
  - Climate change predictions of seasonal shifts.
  - Increased water consumption due to prolonged dry months.
- Website publishing of visual graphs can potentially lead to a drop in water usage.

# Key Finding – Identification of Clear Wet and Dry Seasonal Patterns

CITY OF CAPE TOWN | ISIXEKO SASEKAPA | STAD KAAPSTAD

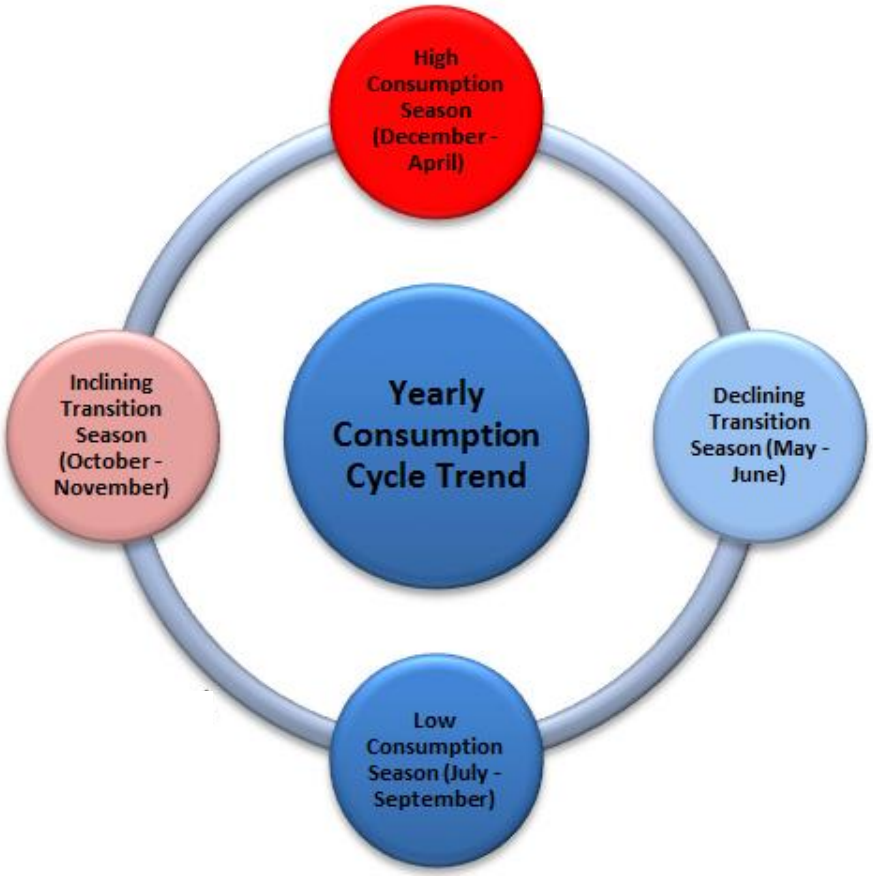
THIS CITY WORKS FOR YOU



# Key Outcome – Identification of Yearly Consumption Cycle Trend

CITY OF CAPE TOWN | ISIXEKO SASEKAPA | STAD KAAPSTAD

THIS CITY WORKS FOR YOU



# Consumption Measurement Reveals Water Saving Success in the South

CITY OF CAPE TOWN | ISIXEKO SASEKAPA | STAD KAAPSTAD

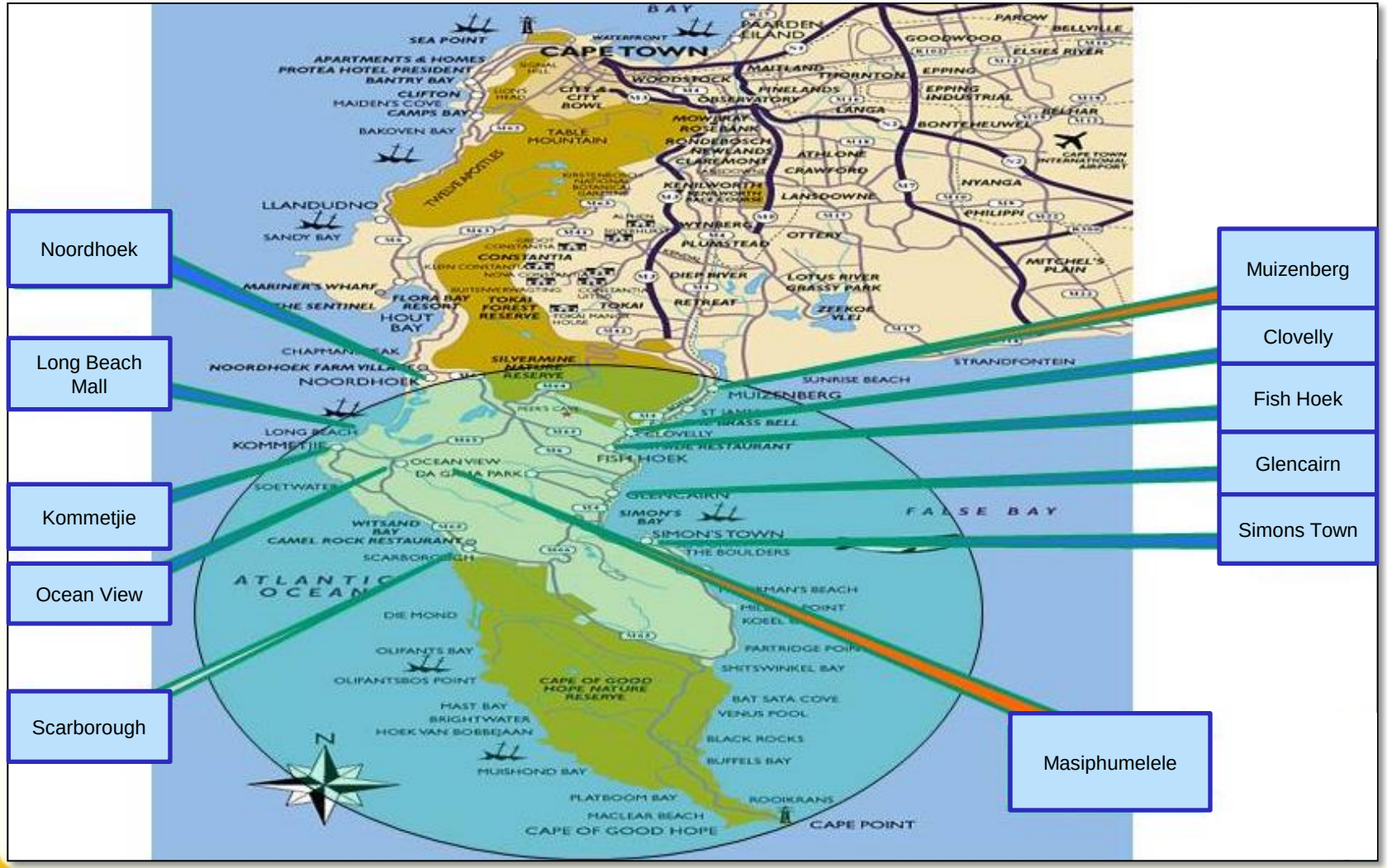
THIS CITY WORKS FOR YOU

- Water Conservation campaign interventions - Southern Peninsula suburbs.
- Campaign interventions included media releases, material distribution, radio advertisements as well as door to door visits.
- The campaign effectiveness were very difficult to measure.
- Water consumption measurement were implemented as main measurement strategy.
- The results revealed significant water savings with positive conclusions on behaviour change.

# Areas Covered During the Southern Peninsula Intervention

CITY OF CAPE TOWN | ISIXEKO SASEKAPA | STAD KAAPSTAD

THIS CITY WORKS FOR YOU



# Water Saving Success in the South

CITY OF CAPE TOWN | ISIXEKO SASEKAPA | STAD KAAPSTAD

THIS CITY WORKS FOR YOU

| Suburb | Number of Properties Analysed | Direct Short Term Impact (6 months before and 6 months after intervention) | | | Percentage Drop in Consumption |
|---|---|---|---|---|---|
| | | Pre-intervention Average Consumption (5.2010-11.2010) (Kl) | Post-intervention Average Consumption (11.2010-5.2011) (Kl) | Drop in Average Consumption- Amount of Water Saved (Kl) | |
| **Fish Hoek & Sun Valley** | 411 | 317 617.23 | 105 361.92 | 212 255.31 | 66.82% |
| **Noordhoek** | 605 | 459 318.16 | 144 657.47 | 314 660.69 | 68.50% |
| **Glencairn, Da Gama & Dido Valley** | 1 023 | 280 201.42 | 160 444.95 | 119 756.47 | 42.73% |
| **Muizenberg** | 1 724 | 244 981.31 | 81 427.07 | 163 554.24 | 66.76% |
| **Masiphumelele** | 1 128 | 589 596.02 | 311 528.08 | 278 067.94 | 47.16% |
| **Simonstown** | 734 | 77 460.46 | 42 465.17 | 34 995.29 | 45.17% |
| **Kommetjie** | 1 049 | 175 551.36 | 65 634.48 | 109 916.88 | 62.61% |
| **Total (Kl):** | | 2 144 725.96 | 911 519.14 | **1 233 206.82** | **57.50%** ✓ |

# Current Measurement Projects

CITY OF CAPE TOWN | ISIXEKO SASEKAPA | STAD KAAPSTAD

THIS CITY WORKS FOR YOU

- The City of Cape Town's current water conservation measurement projects:
  - The City wide implementation of pre-and post campaign surveys.
  - The drawing of pre-and post consumption data of surveyed areas.
  - The identification of areas with extraordinarily high consumptions through data comparison.
  - Analysing consumptive data of the informal car wash industry.
  - Analysing any consumption data for reporting as required.

# Current Measurement Projects (cont.)

CITY OF CAPE TOWN | ISIXEKO SASEKAPA | STAD KAAPSTAD

THIS CITY WORKS FOR YOU

- The City's Water and Sanitation Department are managing a "Keep Saving Water" website.
- This website contains valuable information on all aspects of water saving.
- It also contains a "Consumption Analysis" page.
- High consumption suburbs are identified and visual graphs are displayed.
- This provides a water consumption monitoring platform where residents of identified suburbs can keep track of their consumption.

# Water and Sanitation
# Keep Saving Water Website

CITY OF CAPE TOWN | ISIXEKO SASEKAPA | STAD KAAPSTAD

THIS CITY WORKS FOR YOU

## Keep Saving Water

City of Cape Town > English > Keep saving water

- Home
- What's new?
- Water saving tips
- Alternative solutions
- Re-register your borehole
- Do your water audit
- Educational tools
- Water Ambassador
- Consumption analysis
- Demand strategy
- Links
- Contact us

### Keep Saving Water

The City encourages residents to consciously save water every day, especially during summer when demand typically soars along with the high temperatures. Everyone needs to be aware of what a precious resource water is, and how to use it sparingly.

This website is full of water saving tips for you to use. Once you've started making your own savings, be sure to spread the word – tell your family, your friends, your work colleagues, people in your community and your neighbours - even better, take the Water Ambassador Pledge and become a proud Water Ambassador.

Saving water is the right thing to do. You can save money, reduce the risk of water restrictions and make a personal contribution to our environment.

### Executive Mayor Alderman Patricia de Lille launches Keep Saving Water

In November 2011 the Executive Mayor, Alderman Patricia de Lille launched the Keep Saving Water campaign. At the launch the Mayor said, "We must look beyond the water we can see coming from our taps and think of the whole of society. If we waste water, someone will go without. And if we waste too much water, Cape Town will go without. But we can take measures to ensure the future of our water supply. We can take measures to live sustainably. I appeal to everyone in Cape Town to monitor their water usage, to save water, and to prevent waste. Businesses, industries and the corporate world must also play their part. We ask all sectors of the economy

Water Consumption Analysis

# Potential Future Measurement Opportunity

CITY OF CAPE TOWN | ISIXEKO SASEKAPA | STAD KAAPSTAD

THIS CITY WORKS FOR YOU

- Potential future opportunity includes:
  - Educational opportunity
  - Comparison opportunity
  - Project initiation
  - Regulatory opportunity

# Conclusion

CITY OF CAPE TOWN | ISIXEKO SASEKAPA | STAD KAAPSTAD

THIS CITY WORKS FOR YOU

- Good measurement has potential to improve program quality over the long term.
- Can reveal savings and effectiveness of difficult to measure conservation programmes.
- Proper measurement is crucial in any Water Conservation & Demand Management initiative and serves as an indicator of the level of achievement in meeting the City Water Demand Management & Water Conservation long term strategy objectives.

CITY OF CAPE TOWN | ISIXEKO SASEKAPA | STAD KAAPSTAD

THIS CITY WORKS FOR YOU

# Thank you!