



Grenada Solid Waste Management Authority

Operations Overview

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By: Vaughan Forsyth

Presentation Outline

1. Collection Operations
2. Disposal Operations
3. Waste Segregation
4. Waste Metrics
5. Operations Challenges
6. Waste Diversion Opportunities

Collection Operations

- 7 areas / zones (includes Carriacou and PM)
- 7 collection contractors (private)
 - \geq twice a week collections
 - Curbside collection and community bins
 - 4 to 13 cu yds compactor trucks + flatbed and tipper trucks for special collections
- 6 towns
- 6 street cleaning contractors (private) – towns
 - Maintains cleanliness of streets, drains, curbsides
- 4 field (zonal) Supervisors – monitor
- General public – monitor – complaints documents

Disposal Operations

■ Equipment

- 2 bulldozers (1 Caterpillar D7R & 1 Liebherr 732)
- 2 track loaders (Liebherr 632)
- 1 Pegasus S5000 metal baler with 146 hp turbo diesel engine
- 1 115 hp Vermeer BC 1800XL wood chipper
- 1 LF-500 and LP 530 x 50 – 1200 tyre cutter and shredder

■ Vehicles (chiefly backup)

- 3 Leyland DAF compactor trucks
- 2 Leyland DAF tipper trucks
- 1 Leyland DAF skip truck

Disposal Operations

- 2 disposal sites
 - Perseverance – Grenada
 - Receives approximately 100 tons / day
 - Average of 67 tipping vehicles per day
 - “Old dumpsite” – used for over 35 years
 - Emergency storage site – hurricane derived debris, mainly metal and lumber
 - “new landfill” – engineered landfill with installed leachate collection system
 - commissioned 2002 (OECS project) but earth movements during same year resulted in disrupted use
 - Dumfries – Carriacou
 - Engineered landfill with installed leachate collection system
 - Average of 5 tipping vehicles per day

Disposal Operations - Grenada

- Disposal site opening hours
 - 8:00 a.m. to 4:00 p.m. – Mon. to Sat.
 - 7:00 a.m. to 10:45 a.m. – Sun. & Pub. Hol.
- Weigh bridge with data collection
 - No tipping fee instituted
- Waste segregation
 - Metal, tyres, corrugated cardboard, green waste, excavated material
 - Discourage C&D debris – encourage backfilling instead
 - Voluntary compliance
- No liquid waste or untreated biomedical waste

Waste Segregation

- Metal and corrugated cardboard – baled for containerized export (private sector)
- Tyres – cut and shredded – “rough cuts” – approx. 150 mm with exposed wire and textiles – significant volume reduction
 - Shredded tyres applied to landfill roadway
- Green waste – wood chips – sold
 - future composting demonstration sites
- Excavated material – berm construction and cover material

Metal baler, bales of cardboard and shipping container



Used tyre stockpile - Perseverance



Tyre shredder's outlet hopper - Perseverance



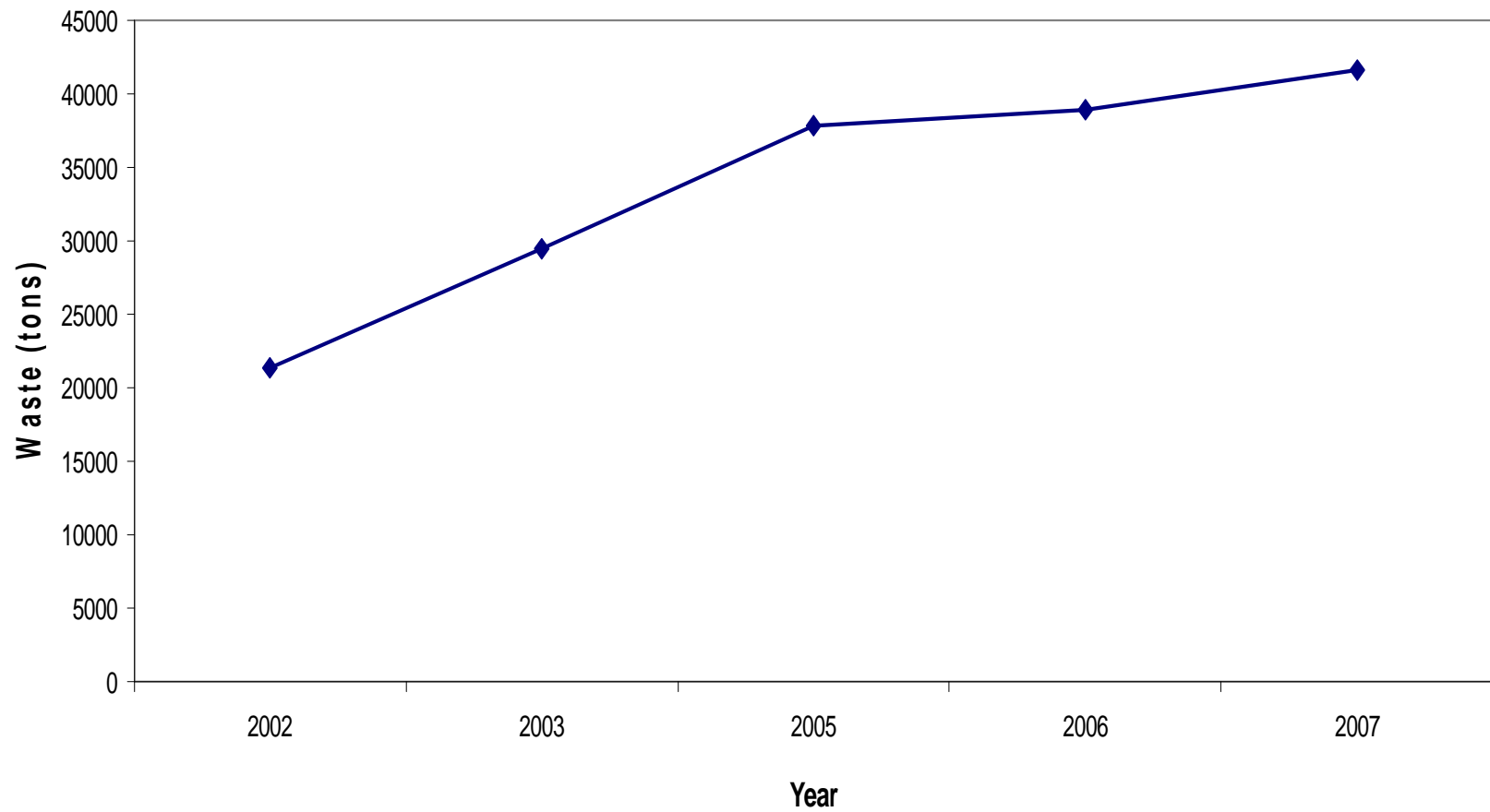
Waste Metrics

- waste received at Perseverance
 - 42 % increase from 2003 to 2007
 - Waste generated from 2003 & 2004 hurricanes still being received
- Per capita waste generation
 - Sensitive to country's economic activities
- Waste received by category
 - Approximately (using 2007 data)
 - 54 % Household waste
 - 25 % Industrial waste
 - 18 % Commercial waste

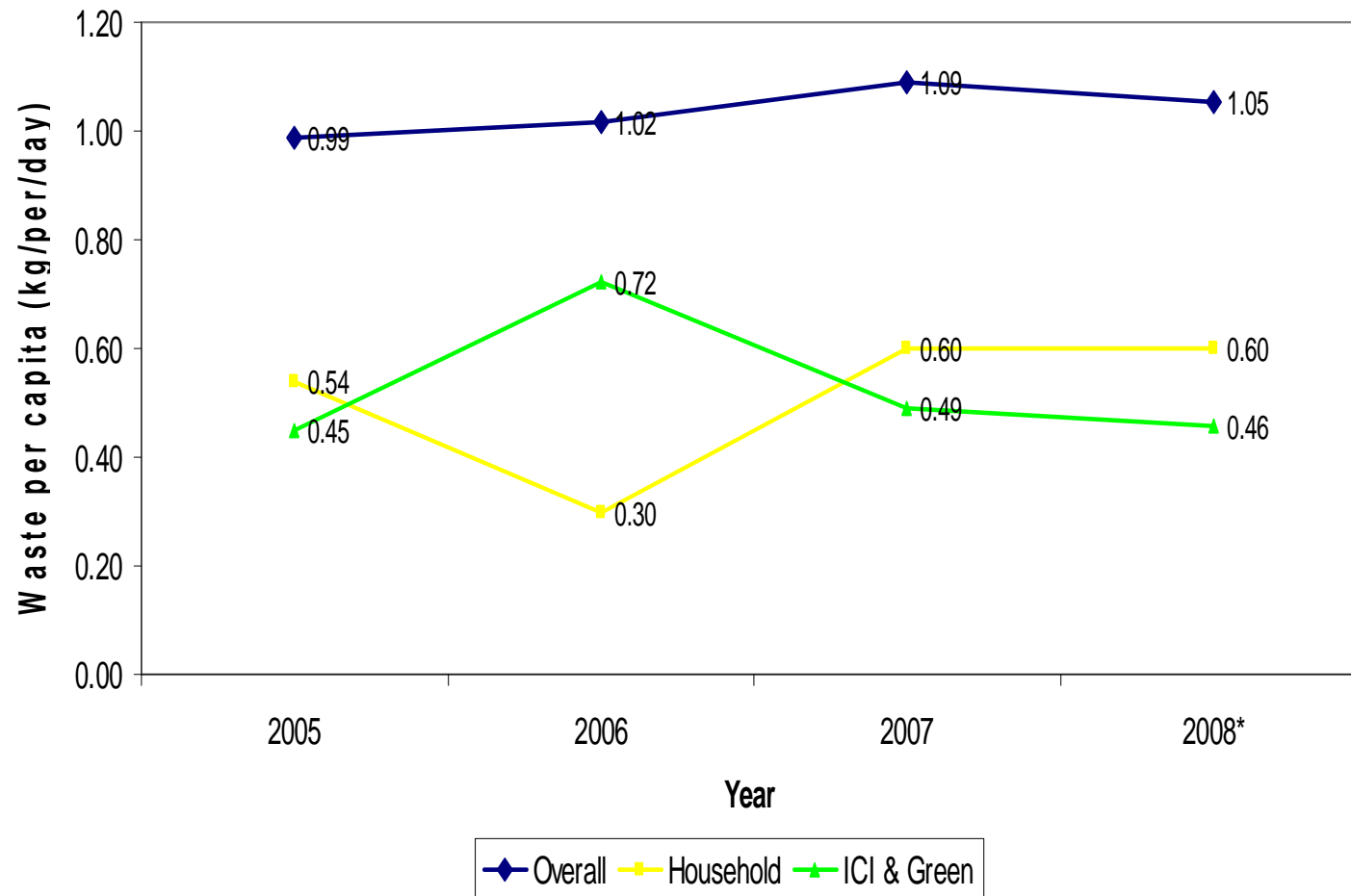
Waste Metrics

- Collection contractor against total waste received – 12 month run
 - Approximately half of total waste recorded is hauled by collection contractors
 - General trend - decreases from Jan to Apr, ramps from May to August. September / October lull before ramping to end of year
- Tyres
 - Increasing proportion of tire imports being used or rethreaded (21% - 2002 to 34 % - 2006)
 - Expansion in use of used tires supposedly driven by lower initial cost
 - 2005 and 2006 - 41 % of tyres imported during the period were received at the disposal site
 - Need for regulation of used tire imports
- Lead Acid Batteries
 - salvaged from waste stream by GSWMA
 - Due to growth of informal recycling sector, very few batteries recovered in recent times

Grenada - Waste Received at Perseverance (2002 to 2007)



Grenada Waste Per Capita (2005 to 2008*)

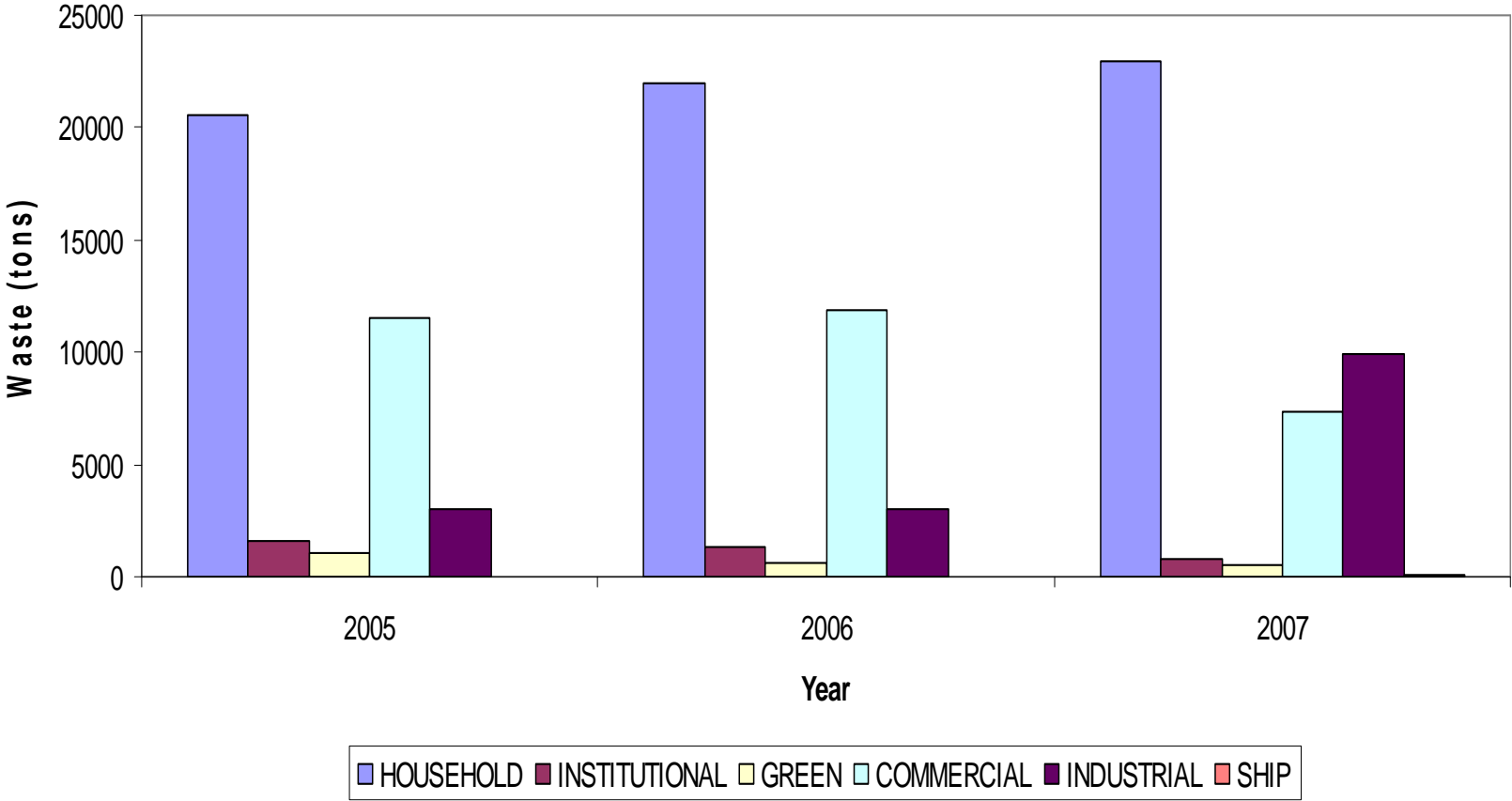


SOLID WASTES GENERATION IN VARIOUS JURISDICTIONS OF THE CARIBBEAN ANTILLES

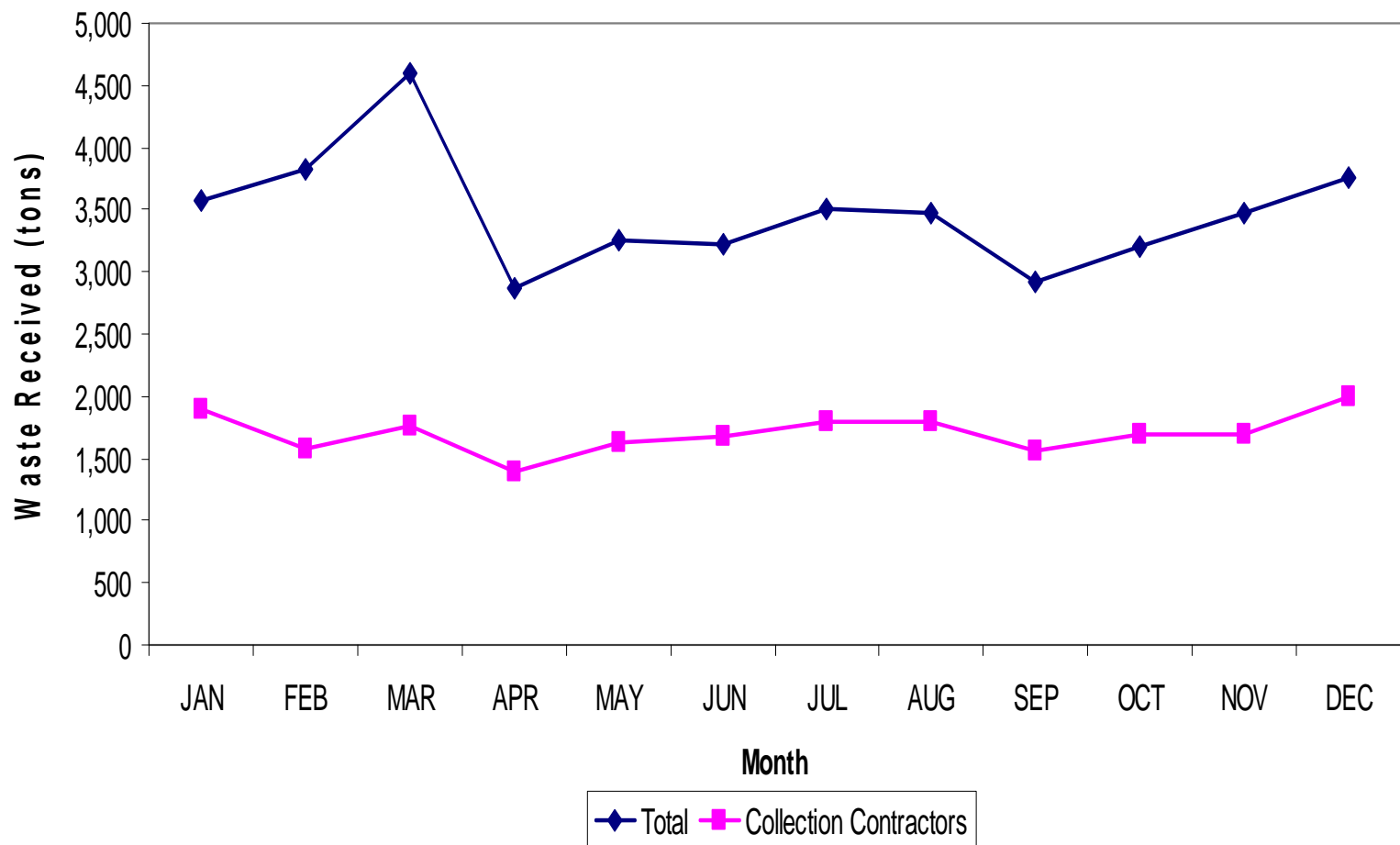
- **U.S. Virgin Islands** **9.0 lbs/capita/day**
- **British Virgin Islands** **6.2 lbs/capita/day**
- **Jamaica** **4.4 lbs/capita/day**
- **Puerto Rico** **3.9 lbs/capita/day**
- **Barbados** **3.3 lbs/capita/day**
- **Trinidad & Tobago** **2.4 lbs/capita/day**
- **Dominican Republic** **1.8 lbs/capita/day**
- **St. Vincent & Granadines** **1.6 lbs/capita/day**



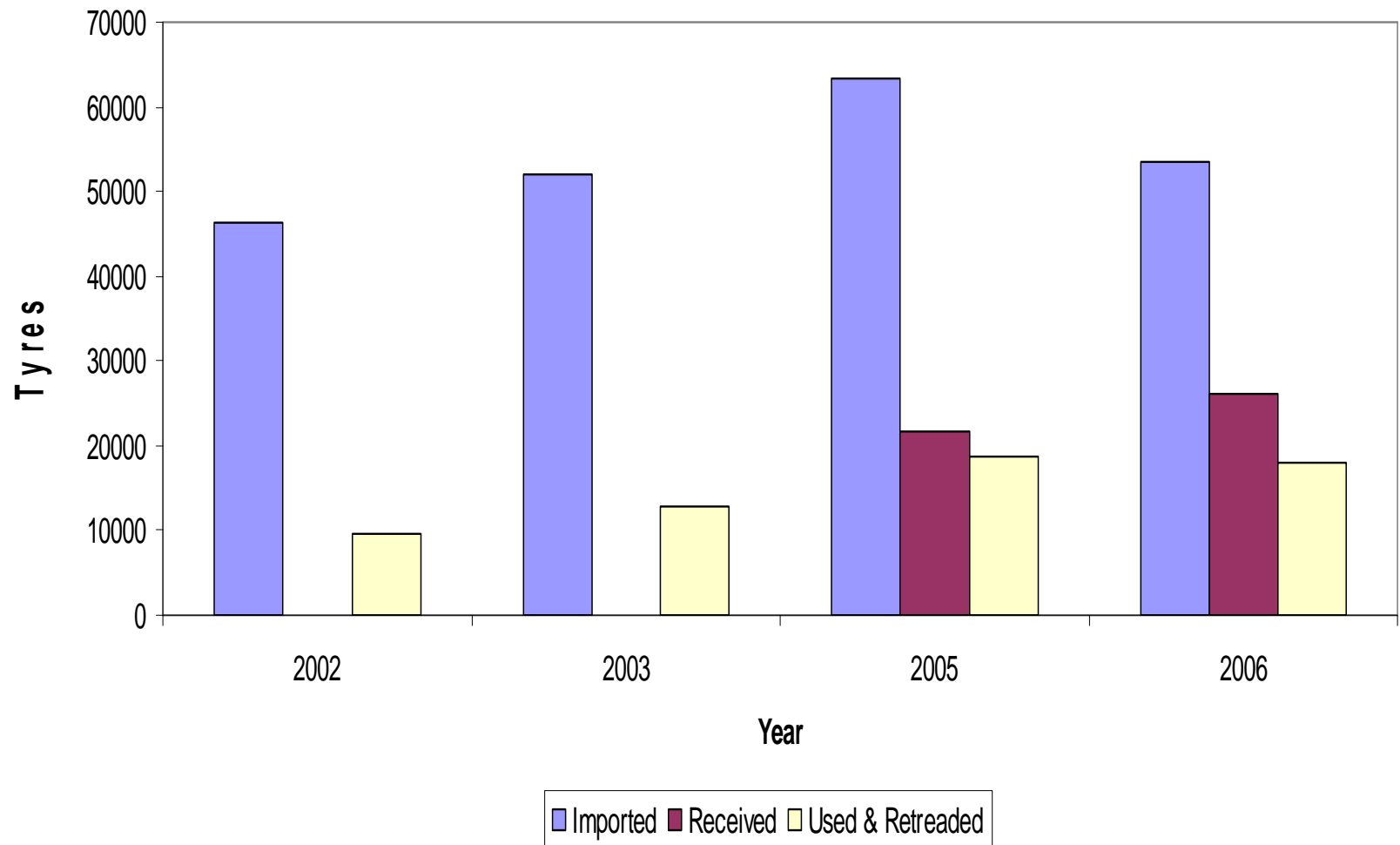
Waste Received by Category (2005 to 2007)



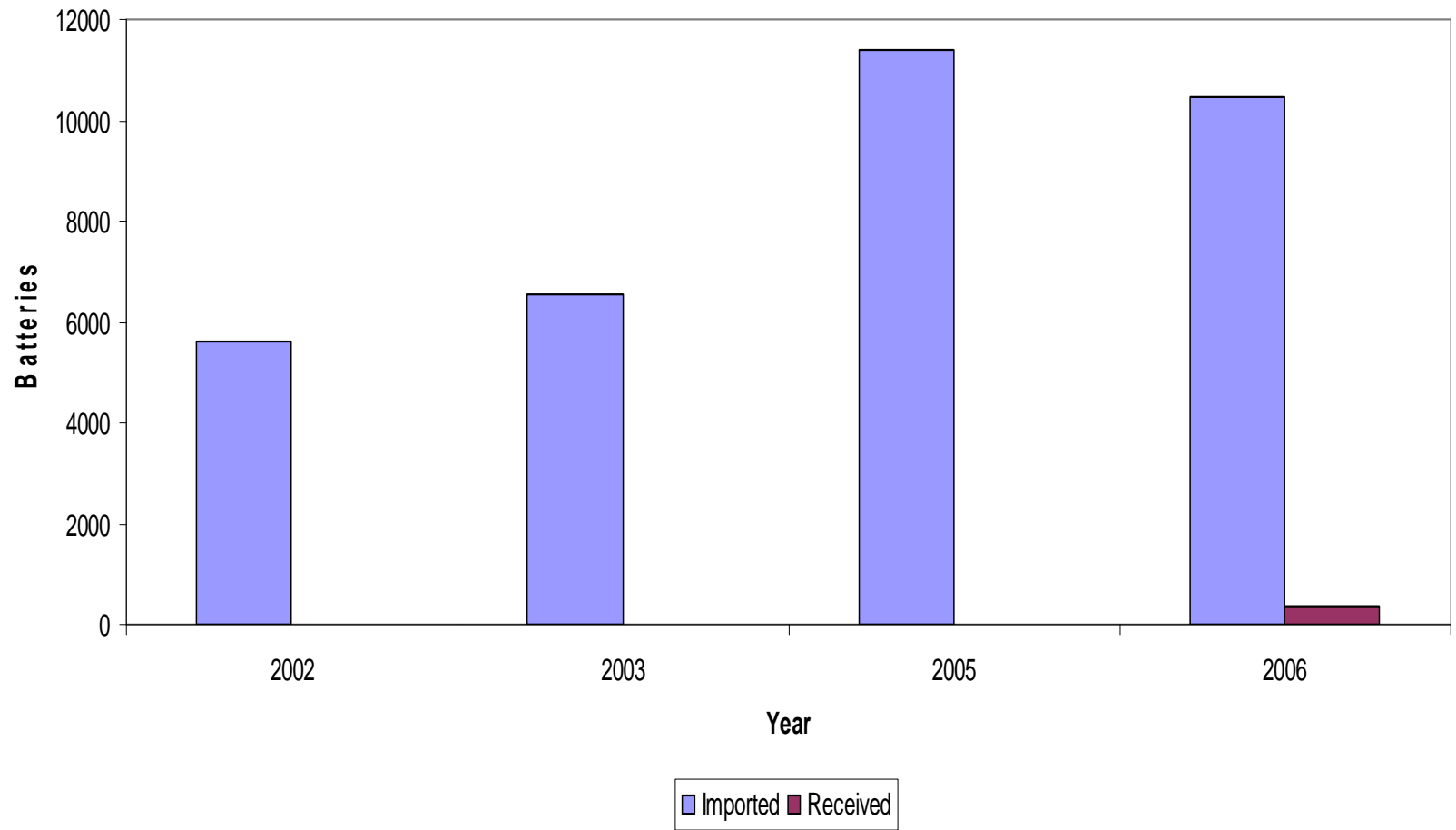
2007 Waste Received Variation



Vehicle Tyres - Imported and Disposed



Lead Acid Batteries Imported and Collected



Operations Challenges

■ Collection

- Access to households
 - Poorly maintained or lack of surfaced roads
 - Lack of proper planning – roads and communities
- Poor HH waste management practices
- “Stray” dogs
- Abuse of system – Community bins and special collection system
 - Commercial generators / unscrupulous haulers
 - Significant roofing materials and lumber by householders

Operations Challenges

■ Disposal

- Lack of adequate disposal facilities coupled with increase in waste generation rates
- Equipment
- Finance
- Illegal disposal – need to enforce regulations
- Disaster debris management plans

Waste Diversion Opportunities

- Informal recycling transshipment – e.g. nonferrous metal ongoing success
 - Needs monitoring – PH & security concerns
- Formal recycling shipments – e.g. ferrous metal, cardboard ongoing success
 - From Nov, 2007 to date:
 - 1,137 tons scrap metal shipped
 - 134 tons corrugated cardboard shipped
- Local recycling initiatives – e.g. packaging material from waste paper
- Composting – decentralised
 - Expansion of hotel, household and institutional composting promotion program
- Variable tipping fee as incentive for segregation
- Waste to energy collaboration

END

Thank You