IMAGE MICROSYSTEMS

Sustainability **Security** **Technical Innovation** **Community**

Signs Made from e-Waste

Protecting the Environment and Saving Money While Reducing e-Waste Plastic in Landfills

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e-Waste—an Ever-Growing Problem

- e-Waste is growing faster than any other type of waste, with an annual volume close to 40 million metric tons globally[1]
  - That's 88,200,000,000 pounds!

[1]Press Release, "Basel Conference Addresses Electronic Wastes Challenge." November 27, 2006, United Nations Environment Programme (UNEP). Available at: http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=485&ArticleID=5431&l=en

IMAGE MICROSYSTEMS

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The Growth this Decade is Mind-Boggling

- A 2010 UN[1] study reports that the growing amount of e-waste could grow exponentially—as much as 500 times over the coming decade
- That adds up to over 44,100,000,000,000 lbs!

[1]Press Release, “Urgent Need to Prepare Developing Countries for Surge in e-Wastes”, February 22, 2010 United Nations Environment Programme (UNEP). Available at: http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=612&ArticleID=6471

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Now, How Much of That is e-Waste Plastic?

- Plastic accounts for 23% of all e-waste[2]
- That's over 10 trillion pounds of e-waste plastic
- Contains UV inhibitors and brominated flame retardants
- Virtually non-biodegradable in landfills

How much waste is in 500 million computers? [1]

Plastics	6.32 Billion Pounds
Lead	1.58 Billion Pounds
Cadmium	3 Million Pounds
Chromium	1.9 Million Pounds
Mercury	632,000 Pounds

[1]Source: "Exporting Harm, the High Tech Trashing of Asia", Basal Action Network, 2002
[2]Source: "Exporting Harm, the High Tech Trashing of Asia", Basal Action Network, 2002

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What Do We Typically Do with All That Plastic?

- "Dirty" plastic is generally considered valueless in the downstream recycling supply chain
  - Typically ends up in a landfill
  - Some is actually incinerated
  - A large percentage is exported to developing countries
- What does this cost us?
  - Environmental costs
  - Landfilling costs
  - Transportation and material handling costs

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10,000,000,000,000 Pounds!

- How do we make that number smaller?
- How do we deal with this sustainably?
- How do we deal with this economically?
- How do we overcome the limitations of the material?
- What industry could benefit from products made from e-waste plastic?

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The Aluminum Roadway Sign Industry

- In the1880s, the League of American Wheelmen (bicyclists), lobbied for better roads and signs.
- Increased with early automobile clubs in the 1900's
- Scattered effort resulted in a wide variety of
  - Sign designs
  - Materials
  - Messages in different sections of highway
- Caused confusion among motorists

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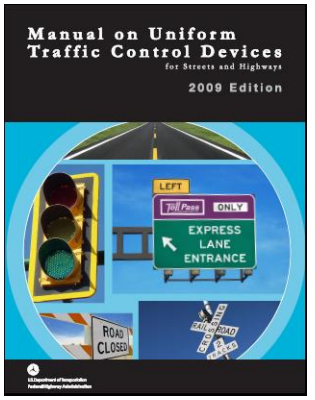
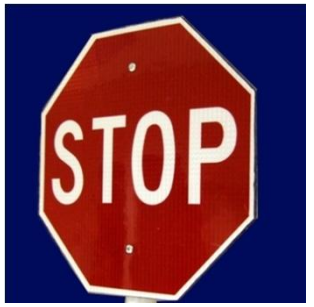
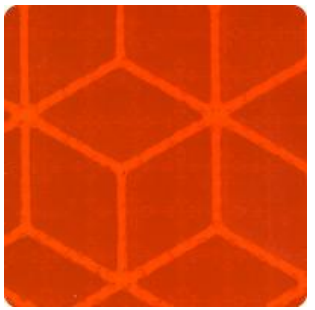
History of Roadway Sign Industry

- In 1924 Bureau of Public Roads takes first steps toward national uniformity
- In 1935 the federally approved *Manual on Uniform Traffic Control Devices* (MUTCD) standardized dimensions and colors
- The development of retroreflective sheeting in the 1940s changed the face of traffic signs forever
  - aluminum substrate became the standard
- Updated with new retroreflectivity and private property standards in the 2000s
- Over 500,000,000 square feet of retroreflective sheeting sold annually in the US—that's a lot of signs!







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Think About 500 Million Square Feet of Signs

- That's the size of the roof area of Walmart's combined 2,700 US Super Centers
  - What if we could replace the carbon footprint and expense of aluminum with e-waste plastic?
  - What if we could replace theft-prone aluminum with e-waste?
  - What if we could develop a product that is tougher, and less expensive than aluminum?
  - What if we could help reduce e-waste plastic while doing so?

IMAGE MICROSYSTEMS

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Years of Research and Investment Yields Results

- Established research and testing partnership with Texas Tech University to create technology
- Developed proprietary grinding and compounding process
- Retrofitted 75 ton presses
- Developed custom compression molding process

IMAGE MICROSYSTEMS

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An Endless Supply of e-Waste Plastic

- Receive e-waste from major OEMs, retailers & others

- Receive spent printer cartridges from consumers

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MicroStrate™ Is the Result

- Signs and road marker substrate material created in 2010 named MicroStrate™
- Coat with high intensity prismatic sheeting
  - TxDOT approves 1st product 2010
- Lower cost than aluminum
- Not theft prone
- Reduces landfilling
- LCA performed by TTU—MicroStrate™ is 1/4th the carbon footprint
- Recent TTU Tests reveal material performs as good as ***if not better than*** aluminum

IMAGE MICROSYSTEMS

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Project Supports the Deaf Community

- We partner with the Texas School for the Deaf
  - Paid internships while in school
  - Eligible for full-time employment upon graduation
- 40% of workforce are deaf or special needs workers
- Translators and VRS in-house
- Inspire us daily with their dedication and appreciation

IMAGE MICROSYSTEMS

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About Image Microsystems

Since 1992, our innovative technology solutions securely refurbish, reuse, and recycle electronics equipment to help you:

- Increase Your Bottom Line
- Reduce Your Risk
- Protect the Environment

We are the only certified zero landfill asset recovery and reverse logistics provider that also manufactures and markets quality, environmentally friendly products made from recycled e-waste plastic components

IMAGE MICROSYSTEMS

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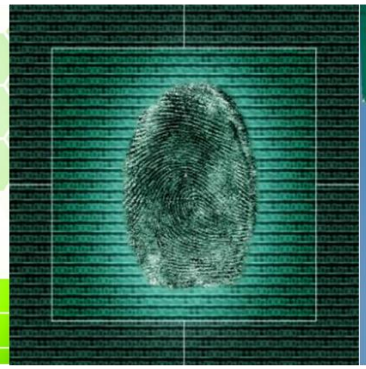
Thank You

Sustainability

Security



Technical Innovation

Community

IMAGE MICROSYSTEMS

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