

# 2011

## The “Concept-to-Reality” Model



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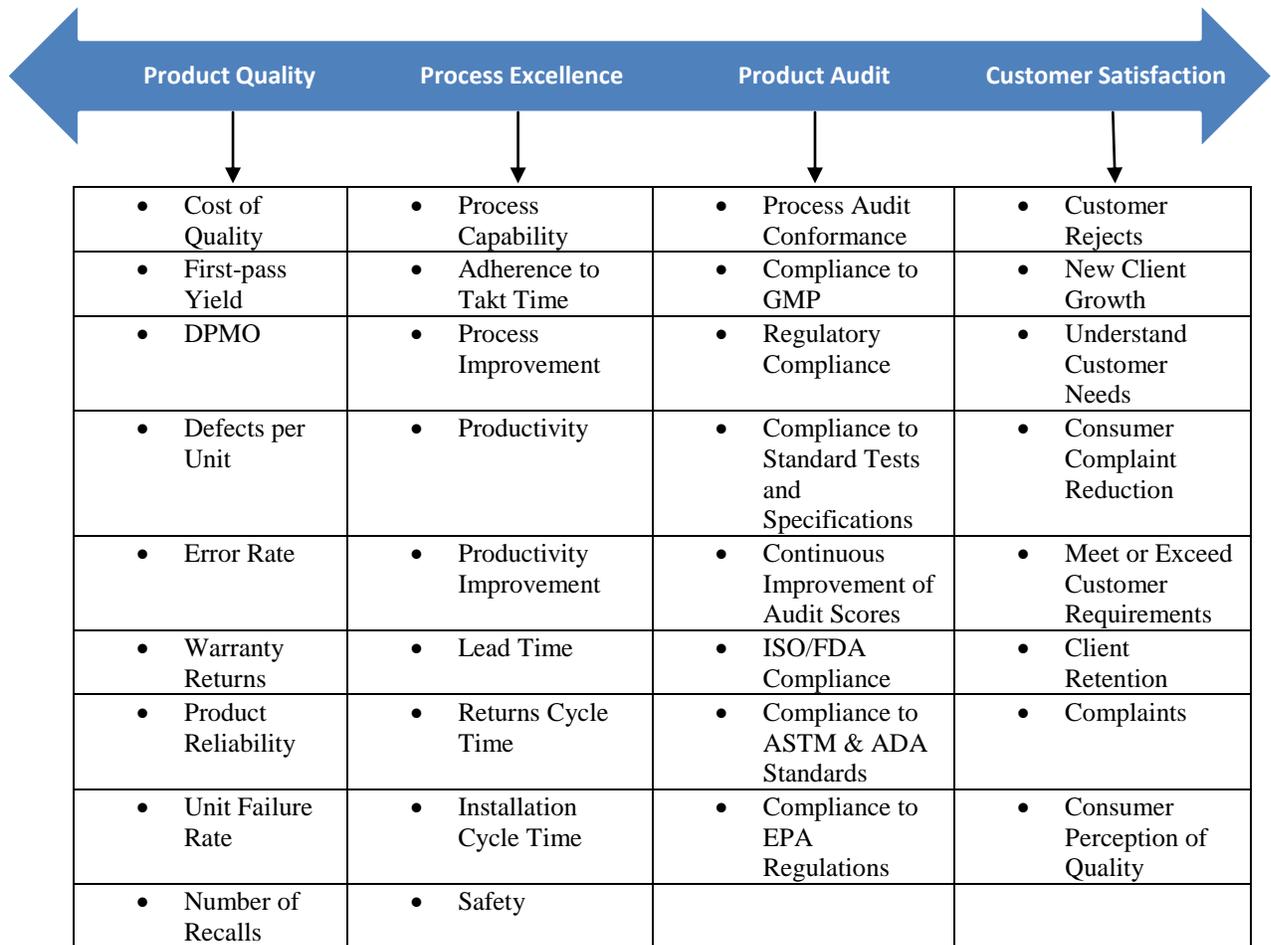
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**I. Introduction**

- Millennium Molding Inc. is a contract manufacturer of plastic, rubber and composite parts; offering complete design and production capabilities. We specialize in recycled materials, taking concepts from design to finished products. With over 100 years of experience in the mold design, product, process, material, development and manufacturing, we deliver quality, cost effective products, designed to meet your specifications.
- The following graphic summarizes the four critical parameters we emphasize to ensure that we can profitably meet or exceed our customers’ expectations.



**Exhibit 1: The four critical parameters of our business**

## II. The Concept-to-Reality Framework (New Product Introduction framework)

The Concept-to-Reality (CTR) provides a template for all of the activities which convert a perceived need or a new idea into a finished product. CTR is derived from the highly successful approach of Six Sigma to develop a new product or design a new process. This approach is called as DMADV (Define-Measure-Analyze-Develop-Validate). Each of the phases in the DMADV approach must be executed properly and completely in order to ensure the emergence of a profitably marketable product.



### Exhibit 2: The Six Sigma Approach (DMADV) for our Concept-to-Reality framework

**Phase 1:** In the **Definition** phase, the nascent idea or the identified market need which have initiated the NPI process are turned into measurable criteria through a formal process of defining and quantifying the attributes which the finished product must possess.

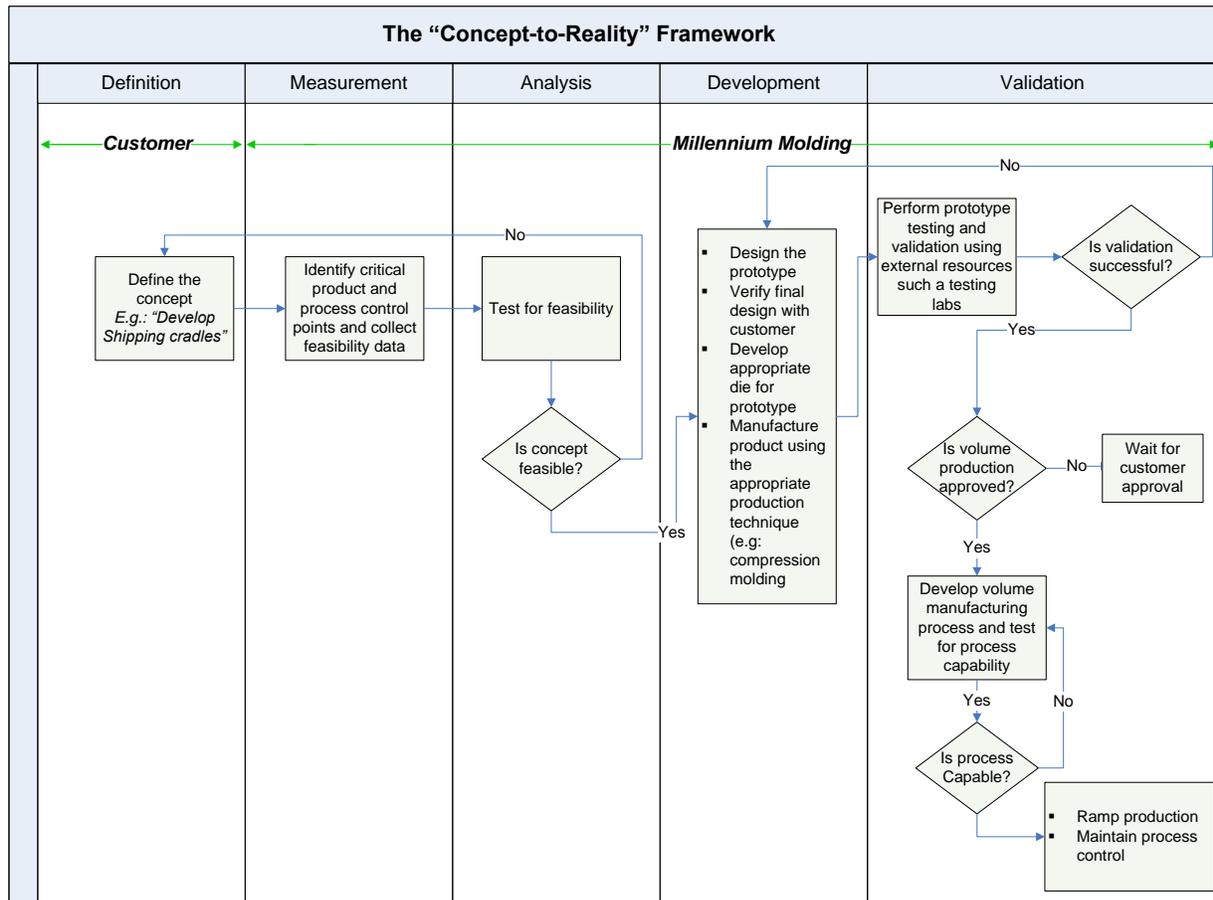
**Phase 2:** In the **Measurement** phase the elements of the design which are critical to product quality and product application are quantified and assessed against the manufacturing process capabilities and metrics are developed to track them.

**Phase 3:** In the **Analysis** Phase, design alternatives are developed and competitively assessed to determine whether a particular design concept is most feasible within the competitive market landscape.

**Phase 4:** In the **Development** phase, design details are created and optimized and prototypes are made for the purpose of design verification. Verification plans are also created in this phase.

**Phase 5:** In the **Validation** phase, the prototypes are validated using the established specifications, and process capability validation is undertaken to ensure that the production of

a quality product is within the capabilities of the production process and also meets the requirements/specifications. At this point, production is handed off to manufacturing and the product is considered “launched”. The product, after the approval of the customer, enters into the **Sustaining Production** phase and is eventually distributed/shipped.



**Exhibit 4: How our “Concept-to-Reality” model works**

Thus, the above model addresses five basic questions asked by any product:

1. Is it possible?
2. Is it attractive?
3. Is it practical?
4. Is it desirable?
5. How do we do it?

The above model also takes into account product lead time, expected quality levels, and economic/cost constraints and delivers the best possible results, maximizing the expected value (and profitability) of the entire supply chain.

### **III. Benefits**

#### **Material**

- The combination of crumb rubber and a urethane binder gives the molded product significant durability and toughness
- Well-suited to outdoor applications and severe environments (salt water, extremes of temperature, etc.) the composite stands up to considerable hardships, delivering durability and imperviousness under very harsh conditions.

#### **Engineering/design**

- Easy design and validation compared to comparable products
- A variety of products can be manufactured using our flexible manufacturing system (FMS) infrastructure
- Our CAD designers will work with you to develop accurate models based on your idea/plan
- Manufacturing is easily scaled up after prototype approval/validation with shorter lead times than other methods

#### **Production**

- Products manufactured from these materials have significantly low total cost of ownership over their expected lifetime
- Crumb Rubber / Urethane composite products contribute towards LEED rating points due to their significant post-consumer recycled content.
- Crumb Rubber / Urethane composite products support environmental conservation (see section VII)
- Millennium Molding products meet the desired specifications and adhere to highest quality and standards
- Millennium Molding products meet or exceed regulatory requirements (such as ADA compliance)

## **Other**

- Crumb Rubber / Urethane composite products contribute towards LEED rating points due to their significant post-consumer recycled content and also make the business ecosystem green
- We significantly contribute towards state of California's goal of increasing the number of tires diverted from the landfill, year-over-year
- We also have the capability to fabricate or manufacture custom molds, reducing your product-to-market lead time
- Our superior process lead to exact scale rapid prototyping of your product in 2-4 weeks
- We are a green business, focused on business and environmental sustainability and on reducing the carbon footprint

Furthermore, Millennium Molding Inc acts as a “partner” and not just a standalone manufacturer in bringing ideas to reality. Millennium Molding offers customer protection through:

- Non-compete Agreements
- Exclusivity Agreements
- Technical and Manufacturing joint ventures
- Joint cost reduction programs

Millennium Molding also offers complete turnkey programs that minimize product handling and shipping costs. We use the “You sell and we deliver” methodology. This further reduces Carbon Footprint of our Recycled Products.

#### **IV. Applications of our products**

Although not exhaustive, following are several applications of products manufactured (or can be manufactured) by Millennium Molding.

- *Decorative Landscaping Curbs and Edging*

A durable and economical alternative to timber or concrete edging, recycled rubber molded hardscape components delivery superior performance and lower lifetime cost of ownership than timber alternatives. Naturally rot-resistant, tire-derived products do not contain creosote or toxic metal salts such as chromium or arsenic.

- *Rubber Mulch Mat*

Rubber mulch is an excellent alternative to wood chip mulch, especially in harsh environments. More durable than wood and less prone to dispersion by winds, insect attack and fungal decay, recycled rubber mulch provides an attractive weed-blocking ground cover with a much lower cost of ownership and smaller carbon footprint than wood mulch. Bound in a mat, rubber mulch is easily configured, placed and contained. Staying in place for years and easily removed if necessary, the product offers significant advantages over traditional wood mulch.

- *Rubber Shipping Cradles*

Millennium Molding is able to provide you with custom-molded shipping cradles specifically engineered to enable the safe transcontinental or international delivery of your product. Our cradles are manufactured from a composite of recycled tire crumbs and a specially formulated urethane binder. More durable than wooden cradles, they also offer greater shock protection than wooden cribbing and are more easily recycled

- *Ballistic Rubber Mats and Walls*

Used in target ranges, recycled rubber matting is naturally sound-absorbent and provides a ricochet-free surface, enhancing range safety. The nature of the composite material allows it to be molded into shapes which baffle sound, reducing the noise levels within the range, decreasing user fatigue.

- *Erosion Control Retaining Blocks*

The recycled crumb rubber composite material is dense and durable, providing significant soil retaining capability. Molded drainage channels, flumes and abutments are easily produced by the Millennium Molding process and can be incorporated into erosion control system which may be deployed at significantly reduced cost

- *Raised Flower Bed*

Replacing creosote or copper-chrome-arsenic impregnated wooden components; recycled rubber is durable, attractive and safe. In addition, rubber provides a softer impact surface for decorative planters in close proximity to play areas.

- *Speed Bumps*

Easily installed by a crew of one or two, recycled rubber speed bumps do not require hot asphalt or additional striping. Modular systems are easily deployed using threaded fasteners and epoxy. Durable, precision-molded and color-impregnated, rubber speed bumps are superior to asphalt.

- *ADA Detachable Warning Tiles and Mats*

Prominent in public areas such as airports, train stations and crosswalk curb cuts, these mats have become a common site in the urban environment. Millennium Molding provides custom-molded and standard mat tiles which are fully compliant with the requirements of the Americans with Disabilities Act.

- *Rubber Playground Surfaces*

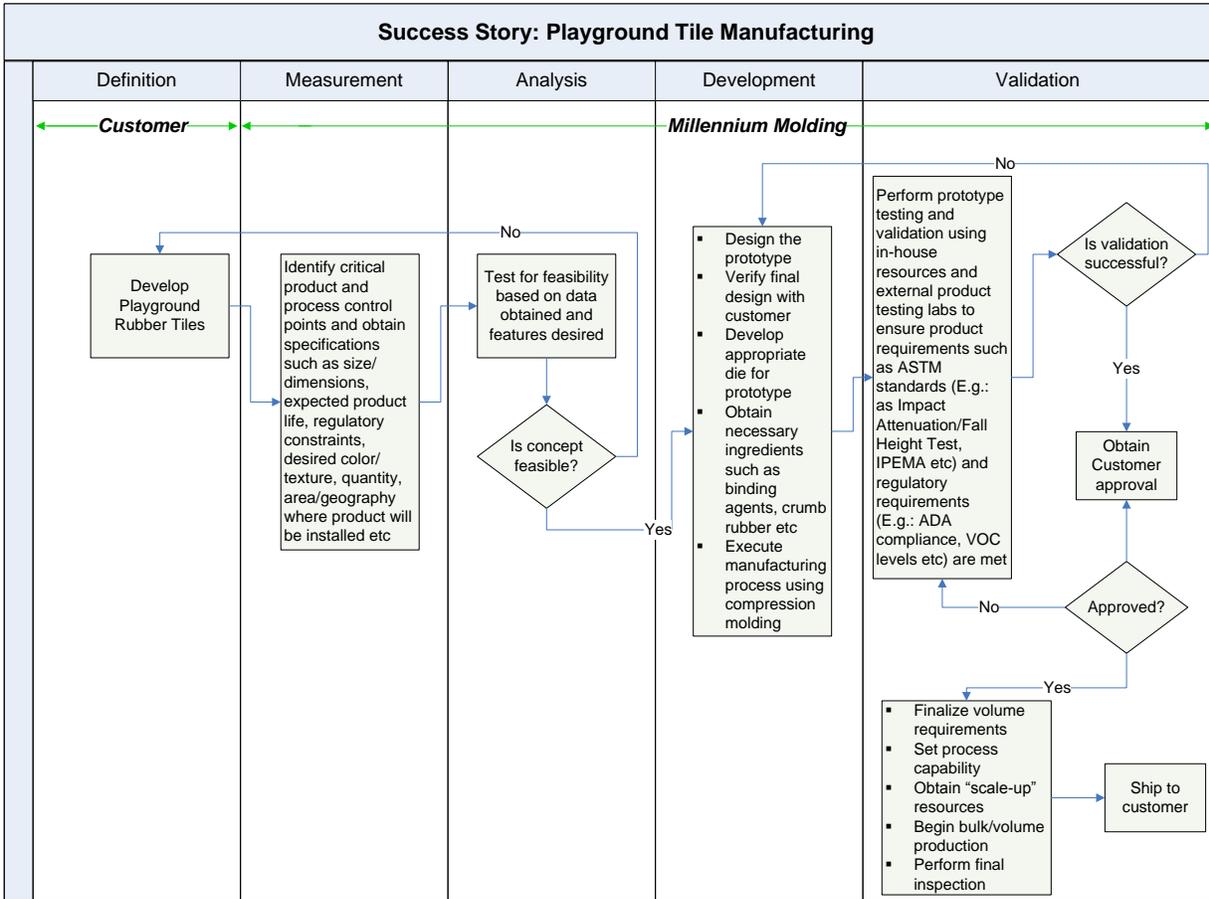
Millennium Molding's modular rubber tile playground surface system is tough, attractive, easily cleaned and available in a wide variety of colors. More durable than pour-in-place rubber playground surfaces, Millennium's system is also more easily repaired if damaged by abuse or vandalism.

- *Rubber Flooring*

Useful in gyms, skating rinks, mud rooms and play areas, Millennium Molding's rubber flooring products are ADA compliant, custom-moldable, durable, resilient and easy to clean.

## V. Examples/Success stories

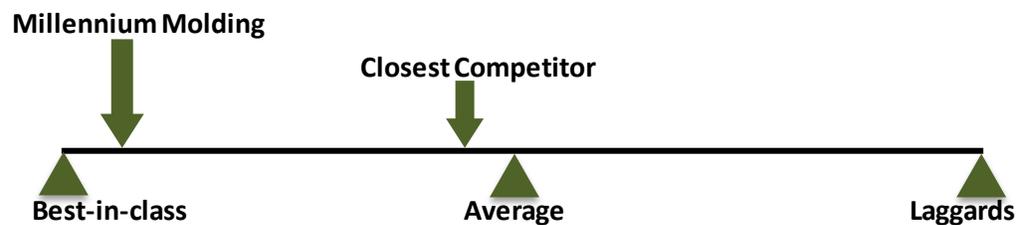
One of our success stories has been in development of playground tiles for a major contract. Cognizant of our past success and about our transparent “Concept-to-Reality” process, the customer came to us with an idea of developing durable, high quality and cost efficient playground tiles that were installed in a public location. Right from the conceptualization phase to manufacturing phase, we seamlessly applied our methodology from the “Concept to Reality” framework. We developed the expected product ahead of time, at a lower cost and with expected quality levels. We do not, by any means, compromise quality and look for efficient ways to reduce costs and share the savings with customers. This playground tile project was not only a success from product point of view, but also from cost point of view. Using lean manufacturing techniques, we have learned to eliminate inefficiencies wherever possible and reduce or eliminate variability/inconsistency in the products. Our success stems from our conscious effort towards sustainable continuous improvement that benefits our customers, our profitability and the environment/society. The following chart reflects our application of “Concept-to-Reality” model for the playground tile example.



**Exhibit 5: Success Story - Playground Tile Manufacturing**

## VI. A peek into our contract manufacturing process (Engineering, manufacturing and Testing)

Our adoption of best-in-class practices such as Design for Manufacturability, Lean Manufacturing and Six Sigma makes our design and manufacturing process extremely efficient and reliable. We ensure that our manufacturing process are cost-effective and of highest quality to provide the customer with value added attributes that are affordable and of highest quality.



**Exhibit 5: Industry Comparison**

### ○ *Engineering*

Our experienced engineering staff consists of CAD designers who work with the customer throughout the design process to ensure that a model specific to customer's needs and specifications is developed. Once this model is developed, our engineering staff evaluates the feasibility of the design and explains you any potential flaws in the design sustainability. After this the staff validates the design, making the design ready for the prototype building process. Our staff uses sophisticated engineering design tools and design for manufacturability principles to develop the conceptual model and is trained to effectively communicate any design issues/flaws that exist in the customer's concept/request. Our engineers are consciously aware that spending appropriate time in the design phase makes sense, as it is not cost efficient to change the design once the prototype is built.

- *Manufacturing*

Our state-of-the-art manufacturing process is one of the best in the industry. We primarily use compression molding process to do most of our jobs. Our manufacturing processes are well equipped to handle all the combinations of Low volume – High mix and High volume – Low mix, Low volume – Low mix and High Volume – High mix. Using proven lean manufacturing practices such as quick-changeover process, we can handle any mix and volume of orders. We also have sufficient capacity dedicated to R&D and prototype building. As part of our lean initiative, we also follow a sound preventative maintenance program, avoiding any unforeseen process breakdowns and providing our customers with good on-time-delivery metric. Our manufacturing practices and processes follow the critical steps required to develop a product that meets regulatory compliance, meets industry standard and the specifications requested by the customer. We pride ourselves on our practices and processes and believe in them. Our belief in our sound processes has led us to offer generous product warranties, making us extremely competitive. Using the best and cost effective manufacturing practices, our products have a low total cost of ownership (TCO) compared to those made by our competitors. Our products have the best in class standards and have one of the lowest lead times in the industry.

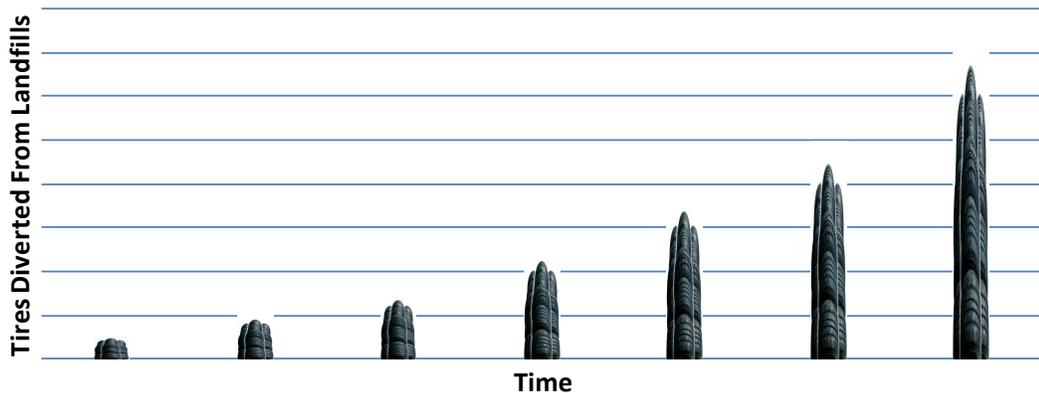
- *Product Testing*

To ensure that our products meet or exceed the highest quality and meet the required regulatory (such as ADA) and safety compliances, we either test our products in our in-house labs or with similar sophisticated external product testing labs. Our products only reach the customer, once the testing requirements and compliances are met, ensuring “peace-of-mind” to the customer for every product that the customer uses. We provide our customers with the testing results and a certificate, for every request that requires product testing.

## VII. How we are helping the environment

Our process is not only cost-effective and of highest quality, but also environmentally sustainable. Since the our raw materials are post-consumer discards such as scrap tire, plastics and other composites, we immensely contribute towards the goals of federal and state bodies, such as CalRecycle, to increase the diversion of scrap tires and plastics from the landfills. Using our efficient manufacturing process, we ensure that all the scrap tires that we receive gets converted into some form of consumer-ready product. Following are some of the highlights of our environmentally sustainable model.

- Our products can be recycled multiple times: Products are made out of recycled rubber. They can be further recycled after their useful life. Molded crumb rubber products are true “closed-loop” recyclables. The embodied material can be reused again and again.
- Our activities are leading to increase in tires diverted from landfills (see chart below)
  - A research estimates that the manufacturers/processors in the rubber recycling industry dispose up to 25% of tires (by volume) that they receive each year (primarily through haulers) to landfills
  - Our activities lead to less than 2% of tires sent to landfills (MM to confirm this number or provide a better number)



**Exhibit 6: Improvement in Tire Diversion Rate**

- We contribute towards decreasing your carbon footprint. Every tire that we recycle diverts 20 lbs of rubber from being used as tire-derived fuel. This encourages those who use tire-derived fuel to seek cleaner sources of energy
- Lack of quality and consistency in recycled rubber products forces some of the consumers to switch to virgin rubber products; our superior processes and products seek to reverse this trend by improving consumer confidence
- Using our web portal and other marketing activities, we reach out to various consumer groups increasing awareness and benefits of using tire-derived products