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From: Christine Boltz, CMB Consulting And Design  
Subject: Options for Backyard Fence Materials  
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## INTRODUCTION

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The purpose of this report is to explain the findings of my research on which material will be best to use for your home's backyard fence. As we discussed in our initial meeting, your fence must provide privacy and create an enclosed area that will keep small children in and keep other people and animals out. We determined that you should install a privacy fence, which the industry defines as being approximately 6 feet high with boards spaced close enough that no one can see through them (Marks) .

Privacy fences are available in a variety of materials, and we determined that for your yard we should consider three of the most common fencing materials: wood, vinyl, and composite (a mix of wood and vinyl). I investigated the advantages and disadvantages of each type and evaluated them against the three criteria you described as being the most important to your decision. These criteria are:

- **Amount of required maintenance:** Because of your busy schedule, your fence must require as little maintenance as possible. Even without maintenance, it must last at least 10 – 15 years (preferably longer) in Southeast Michigan's sometimes-extreme weather conditions.
- **Environmental impact:** You would like to use recycled or sustainably produced materials that involve as few toxic chemicals as possible, both during manufacturing and after installation.
- **Cost:** You would like to use a lower-cost material if it fits your other criteria.

In this report, I describe my research methods, compare each individual material against each of your three criteria, and explain how I chose a fence material to recommend.

After extensively researching the advantages and disadvantages of each material, I have determined that a composite fence will be the best option for your home since it will require little maintenance, have a long expected lifespan, and impact the environment the least. Although a composite fence will be the most expensive option, it will only be slightly more expensive than a vinyl fence or a wood fence including maintenance costs.

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## METHODS

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The primary resource for this report was internet research. I extensively searched for reputable, unbiased sources on different fence materials. I tried to avoid using manufacturer and retailer sites although I did find useful information on the sites of Lowes and Home Depot. These two stores sell many types of fencing and devote large parts of their sites to general home improvement information that is not specific to particular brands or products.

To adequately compare the costs between materials, I performed several of my own calculations based on data found on the Internet. These calculations include the average lifetime cost including maintenance (see Figure 5) and the cost of cleaning and sealing a wood fence (see Figure 2),

### Cost information.

While researching different fence types, I found that costs vary widely. Factors affecting costs include:

- **Geographic region:** Different types of fences are more popular and more readily available in different parts of the country.
- **Installation costs:** The cost of installing a fence varies depending on the contractor.
- **Components and features:** A fence has multiple components that are can be installed, such as panels, posts, and gates, depending on the layout of the yard and the homeowner's preferences.
- **Cost of raw materials:** A type of fence will be impacted by the cost of its raw material. For example, vinyl may be more expensive if the cost of oil increases (DiFulco).

|           | The Washington Post | HouseLogic.com |
|-----------|---------------------|----------------|
| Wood      | \$25                | \$20 – 50      |
| Vinyl     | \$35 - 50           | \$40 – 60      |
| Composite | \$40 - 60           | \$40 - 60      |

**Figure 1:** Comparisons of Materials Price Per foot

Figure 1 compares the results of two of the best price comparisons I found: a June 2008 article in *The Washington Post* (DiFulco) and a March 2010 article from *HouseLogic.com* (Marks). Both of these articles noted the wide range of fence costs while providing “ballpark” figures.

As a result, the cost information presented in this report should be used as general guidelines, not as specific prices. Although the prices that I found quoted in my research varied, most sources agreed that that wood was generally much less expensive than vinyl or composite.

### Types of wood

When we discussed the use of wood at our meeting, we did not discuss the different types of wood available for fences. However, during my research, I discovered that some types of wood, particularly cedar and redwood, last longer and require less maintenance and treatment than other types of wood, such as pine. However, cedar and redwood are used mostly on the west coast and are not readily available in other parts of the United States, including Michigan (“Fencing”). As a result, this report uses the term “wood” to describe pine and similar wood types since they are most likely to be sold by Michigan vendors.

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## **RESULTS**

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Following are the findings of my research on each material.

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### ***Wood***

#### Maintenance

Wood is highly susceptible to weather, insects, and ultraviolet light (Marks). As a result, the lifespan of a wood fence depends upon how well it is maintained, and an untreated wood fence can be expected to last only 4 – 6 years (“Fencing”). Even with proper maintenance, wood has a shorter life span than other materials (Marks). *HouseLogic*’s comparison found that vendor warranties for wood fences usually last no longer than 15 years (Marks).

A homeowner who decides to purchase a wood fence must make the first maintenance decision before installation: whether to pay more for a pre-treated fence or pay less for an untreated fence which should be sealed and water-proofed before or immediately after installation (“Fencing”). According to *TheNaturalHandyman.com*, the process of pressure-treating and sealing new wood must be done with extreme care so that all surfaces are properly treated and do not shrink or warp excessively. After pressure-treating, the wood must dry for 3 weeks to 6 months (depending on the weather and the treatment method) before it can be painted or stained (“Pressure-Treated Wood—Its Uses”).

Regardless of whether a wood fence is bought pre-treated or treated upon installation, it should be cleaned and retreated every 3 – 5 years (“Fencing”).

#### Environmental Impact

Wood itself is a natural resource although harvesting wood often contributes to the destruction of forests and ecosystems. *Natural Home* magazine recommends that homeowners buy wood that the Forest Stewardship Council (FSC) has certified as being from well-managed forests. However, homeowners should confirm the actual wood they are buying is FSC-certified, since many companies prominently advertise that they sell certified wood while only a few of their products are actually certified (Martin).

Additionally, the chemicals used to treat wood can be toxic. Although the lumber industry has voluntarily stopped pressure-treating wood with highly toxic chromated copper arsenate, the chemicals currently in use may still have health and environmental risks (Martin). Less toxic treatments are available but may not protect wood as effectively (“Pressure-Treated Wood—Its Uses”).

### Cost

In general, wood is the least expensive of the three types of fence materials, although prices vary widely. *The Washington Post* reports that a pressure-treated wood fence costs around \$25 per foot (DiFulco), while *HouseLogic* finds that a wood fence costs \$20 – 50 per foot (Marks).

Regularly maintaining the wood fence will also require purchasing additional supplies throughout its lifetime (“Wood vs. Vinyl”). The cost of maintenance supplies will vary widely depending on the products used, the amount of wear the fence endures, and how frequently the fence is maintained (ThompsonWaterSeal). Using the prices of a common brand of exterior wood products, I calculated that the cost of cleaning and sealing a fence one time will be approximately \$2.45 per foot of installed fence (see Figure 2 for a breakdown of these costs). If the fence is cleaned and sealed every four years during a 15-year life span, it would be cleaned and sealed a total of three times so that the total lifetime maintenance cost would be approximately \$7.30 per foot. This cost breakdown does not include other supplies, such as protective eyewear and brushes, since these are usually inexpensive and may have been purchased for other tasks.

| Product  | Cost per gallon <sup>2</sup> | Coverage per gallon <sup>3</sup> | Cost per one foot of installed fence <sup>4</sup> |
|--|------------------------------|----------------------------------|---|
| Thompson's® WaterSeal® Heavy Duty Deck Cleaner <sup>1</sup>              | \$17.06                      | 100 - 250 square feet            | \$1.17  |
| Thompson's® WaterSeal® Waterproof Plus Clear Wood Protector <sup>1</sup> | \$26.65                      | 200 – 300 square feet            | \$1.28  |
| Total supplies per cleaning and treatment per one foot of fence          |                              |                                  | \$2.45  |

<sup>1</sup> These products were chosen as examples of common exterior wood maintenance products and are not recommended or endorsed by this report.

<sup>2</sup> These prices were the lowest found via Google Product Search, which found the lowest price at discountpaint.net.

<sup>3</sup> Coverage per gallon is from the ThompsonWaterSeal products web site.

<sup>4</sup> Cost per foot of installed fence is calculated as the cost per gallon divided by the average coverage per gallon, multiplied by 12 (since one foot of a 6-foot fence equals 12 feet of surface area to cover). For example, the cleaner cost per foot installed is \$17.06 divided by 175 (the average of 100 - 250) multiplied by 12.

**Figure 2: Lifetime Maintenance Costs for Wood Fencing**

An additional consideration is that a wood fence's shorter life span means that it will have to be replaced sooner than a more durable fence type.

## ***Vinyl***

### Maintenance

According to *The Washington Post*, “anything that wood can do, vinyl can do, too, but with a lot less maintenance” (DiFulco). *DoItYourself.com* describes vinyl as being “virtually maintenance-free” (“Your”). Because it is a type of plastic, vinyl is very resistant to weather and insect damage and, therefore, does not need to be treated as wood does (“Chain”). The color is mixed into the vinyl during manufacture so the fence will not need to be repainted, although some homeowners have reported that over time, a vinyl fence can fade or look “chalky” (“Your”).

Vinyl has a smooth surface that repels dirt (“Tips”). Rainfall alone will often keep a vinyl fence clean although users may sometimes need to spray with a garden hose or clean with a mild detergent (“3 Things”). Many homeowners like vinyl fences because they are easy to remove

graffiti from (“Wood vs. Vinyl”), which indicates that children’s drawing would probably be easy to remove from a vinyl fence.

According to *HouseLogic*’s comparison, vinyl fences usually have a warranty between 20 years to a lifetime (Marks).

#### Environmental impact

According to the Healthy Building Network, the majority of vinyl fences now available are made from polyvinylchloride (PVC), which creates a number of hazardous by-products during its manufacture. Some manufacturers have started offering fences made from High Density Polyethylene (HDPE), another type of plastic that appears to be safer and may even last longer than PVC. However, retailers selling HDPE fences may be difficult to locate (Calkins).

Compared to wood, vinyl’s longer lifespan could somewhat offset the energy and resources used in its production. Also, a vinyl fence does not require the homeowner to regularly maintain it using dangerous chemicals.

#### Cost

Vinyl fencing is more expensive than wood to purchase, although it will last longer and cost very little to maintain (Marks). *The Washington Post* reports that vinyl fencing costs \$35 - \$50 per foot, depending on height (DiFulco). *HouseLogic* reports that a vinyl fence costs about \$40 - \$60 per foot (Marks).

### ***Composite***

#### Maintenance

Like vinyl, a composite fence requires little or no maintenance and never needs painting (“Your”). Composite materials also do not fade and, as a result, are available in darker colors than vinyl is (DiFulco). *HouseLogic* finds that most manufacturers offer a warranty between 20 years to lifetime (Marks). However, composite material has only recently been used in fencing, so it is unknown how well a composite fence may hold up after several years of weather and sun exposure (Tobias).

#### Environmental impact

Composite fencing is often made from recycled wood or wheat straw and recycled plastics (Tobias). One well-known manufacturer of recycled composite fences is Trex (DiFulco). However, consumers often have difficulty determining what percentage of a product’s material is recycled (Tobias).

#### Cost

Composite fencing can vary widely in price (Marks). *The Washington Post* reports that a composite fence costs approximately \$40 - \$50 per foot (DiFulco). *HouseLogic* reports that, like vinyl, a composite fence costs about \$40 - \$60 per foot (Marks).

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## CONCLUSIONS

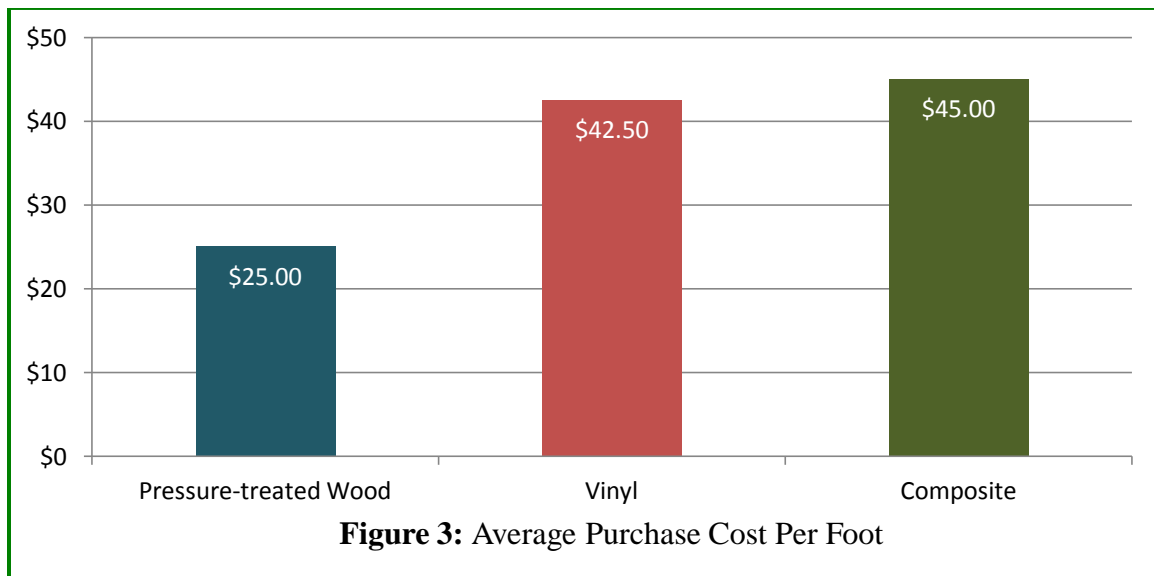
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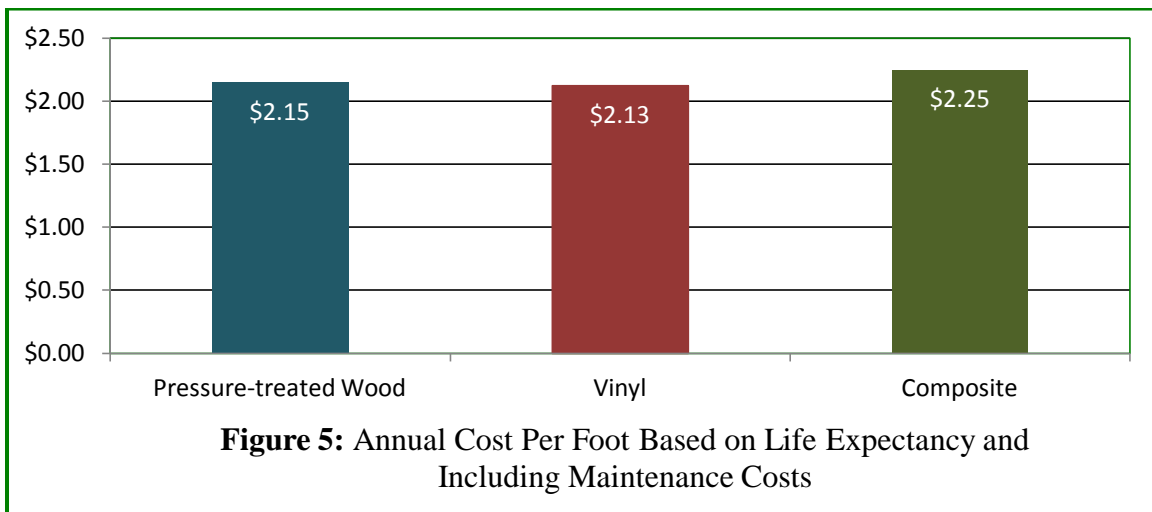
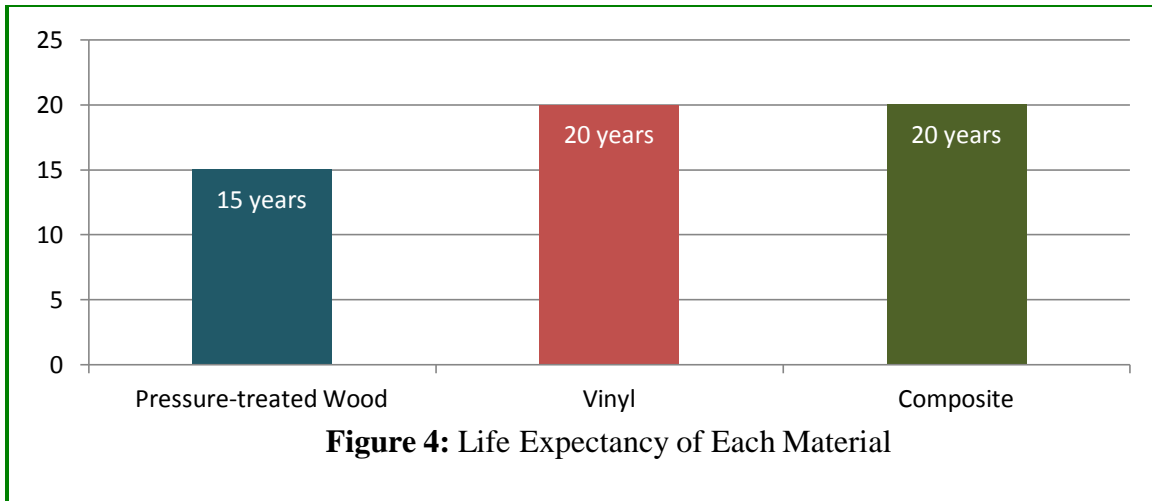
Each type of fence material involves a trade-off between the three criteria. Although wood is the least expensive option, particularly when it is purchased untreated, it requires periodic maintenance using potentially toxic chemicals and has a shorter lifespan (especially if it has not been maintained well).

Both vinyl and composite fencing require virtually no maintenance or the regular use of chemicals. Additionally, even taking into consideration that composite fencing has not been used long enough to confirm its durability, vinyl and composite have longer life expectancies than wood.

A major drawback to vinyl fencing is the hazardous by-products involved in its manufacturing process. A composite fence, however, especially one made with a high percentage of recycled materials, has much less environmental impact than vinyl.

To better understand the overall cost of each material throughout its life span, I calculated the average cost per year based on the expected life span and its expected maintenance costs (see Figures 3 - 5).





From these calculations, I determined that although the initial purchase price of composite may be an average of 80% more than the initial purchase price of wood, the annual cost of a composite fence may only be about 5% more than the cost of wood.

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## RECOMMENDATION

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Based on this research, I recommend that you install a composite fence made of recycled materials since it requires little maintenance and has the least environmental impact. Although its initial cost is much higher than wood and slightly higher than vinyl, it will most likely be nearly as cost-effective in the long run since it will last longer and require no additional expense to maintain.

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