Money Does Grow on Trees!

Investing in Ramsey’s Streetside Urban Forest

Planting ahead: Ramsey’s street tree inventory as a proactive approach to planning for a resilient city

Tree inventories are used to assess and manage forest and community trees. As a tool for Urban Forest Management, they guide and inform public officials to **prioritize and budget for the proactive management of public trees.** Beyond aesthetic appeal, trees provide a multitude of **ecosystem services (stormwater benefits, pollution mitigation, and energy savings)** to individuals, businesses, and visitors alike. An inventory can be used for management and policy recommendations, to quantify the dollar value of a city’s urban forest, and to educate residents about the benefits of a well-managed community forest.

A regularly-updated inventory provides Ramsey with crucial data for maintaining its trees, enabling Ramsey to eventually **manage larger and more complex urban forests**. Well-managed trees will ensure that **future generations of Ramsey residents** will share in the benefits of **more engaging public spaces** and a **connected community**.

Improved Drainage

Trees **reduce stormwater runoff** by absorbing the water down their trunks and into the earth below. They act as natural sponges by filtering water and **preventing stormwater from carrying pollutants** into natural waterways like rivers and lakes.

Energy Savings

Trees benefit neighborhoods and homes by **reducing energy costs.** During hot summer months their shade can reduce **air conditioning** use and during the winter they provide wind barriers to decrease the need for **heating**.

Vibrant Community

Embracing the ecosystem services and property value added by trees will lead to smart planting practices, which in turn benefits the well-being of communities. Trees promote community vibrancy by improving **health**, **safety**, and **neighborhood satisfaction.**

Cleaner Air

Trees improve air quality by **absorbing and storing CO2** while **releasing oxygen** back into the atmosphere. They clean the air by absorbing odor and pollutants by filtering out **airborne particles.**

Added Property Value

Trees improve the value of homes and the aesthetic appeal of a neighborhood. In addition to providing **shade** and **privacy**, a well maintained landscape add **curb appeal** and increases the value the property.

We have three main objectives for developing a street tree planting framework

Information • Provide the City of Ramsey with the information and resources necessary to make better budgetary and management decisions for their upcoming Comprehensive Plan

Pilot • Examine the value of an inventory through a “micro” pilot of Sunwood Drive, which assesses tree genus, diameter at breast height (DBH), location, and canopy quality

Vision • Suggest a long-range vision for tree planting in Ramsey, which can be made possible through regular inventorying and assessment

We will see the benefits of a tree inventory in the following posters...

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References:
PennState Extension. (2017). *Conducting a Community Tree Inventory*. Retrieved from https://extension.psu.edu/conducting-a-community-tree-inventory
United States Forest Service. i-Tree Design (Version 6.0) [web application]. Available from https://design.itreetools.org/

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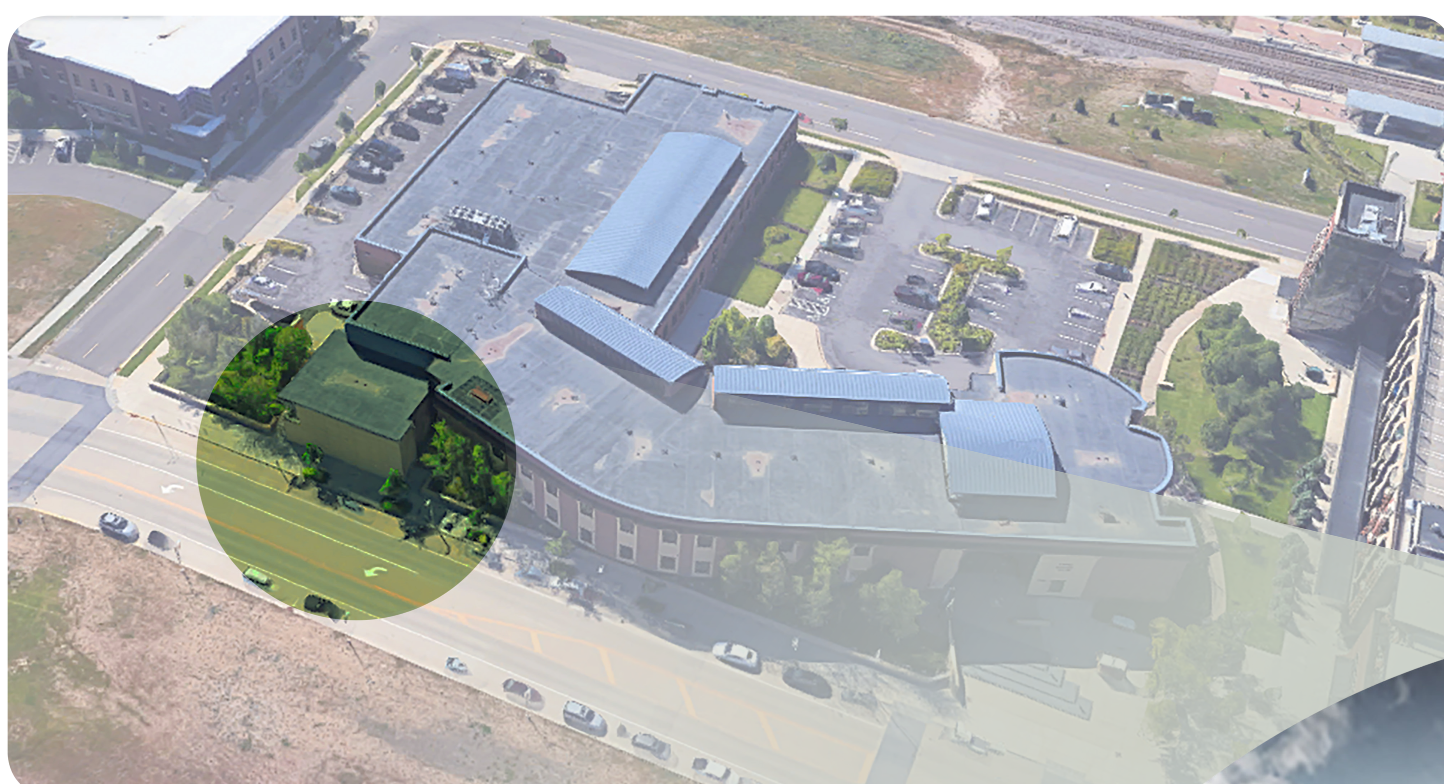
Benefits

An appreciative tree advantage:

A look at the 20-year benefits of street trees

Trees are unique assets to cities and properties because they generally appreciate in value as they grow and age. Some trees do survive the urban environment for over a century, but most city street trees have a lifespan of up to 20 years.

Even so, in two decades a tree can impart significant benefits, and as the tree ages it adds to **property values** and more efficiently provides **ecosystem services** to owners and the wider community. With patience, young trees will start generating more value than the cost of planting and maintenance.



Over the next 20 years, these two oak trees outside Ramsey City Hall will perform valuable services and increase property value as the canopy grows...

2017 $47 > 2037 $154 > 20 years $1,168

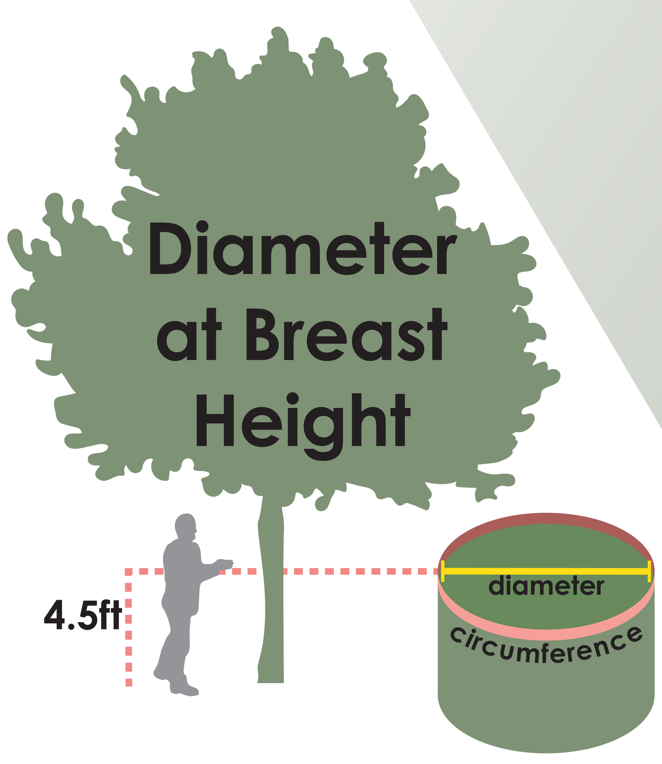
Return on Investment

over one year

$1 spent on tree management > $4 returned to the community

Original image: Google Maps
Populated with image from www.skalgubbar.se

Diameter at Breast Height



A tree's age and size is inferred from its Diameter at Breast Height (DBH), which is the trunk diameter at 4.5ft from the ground. Measuring DBH is non-invasive: find the diameter using a diameter tape or by caculating from the circumference.

CO_2 Removal

10,676LB

Equivalent to the annual emission of a typical passenger vehicle

Electricity Savings

1,461KWH

Enough to power a household microwave for **81 days**

More Property Value

$44 if each tree grows to 10" DBH

Compared to **$23 in 2017** with approximately 4"-5" DBH

Stormwater Interception

19,093 GALLONS

Stores and filters enough runoff to fill **477 bathtubs**

Natural Gas Savings

285THERMS

Enough to operate a household dryer for **59 days**

Trees Generate Diverse Benefits and Savings
Trees are nature's workhorse, and they provide significant and measurable benefits to communities. Street trees **clean the air, reduce energy expenses, filter stormwater,** and **increase property values**. We will first explore how street trees help **maximize stormwater management by reducing surface water pollution**.

Stormwater

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References:
Casey Trees & Davey Tree Expert Co. National Tree Benefit Calculator (Beta) [web application]. Available from http://www.treebenefits.com/calculator/
United States Forest Service. i-Tree Design (Version 6.0) [web application]. Available from https://design.itreetools.org/

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Stormwater

Improving Runoff Drainage

Each year, Ramsey receives 14 to 15 billion gallons of rainfall. New development expands **impervious surface area**, which includes surfaces like parking lots and roofs that are impenetrable by water. Stormwater mitigates flooding by channeling rainfall to stormwater ponds and other surface waters (e.g. wetlands, lakes, and rivers).

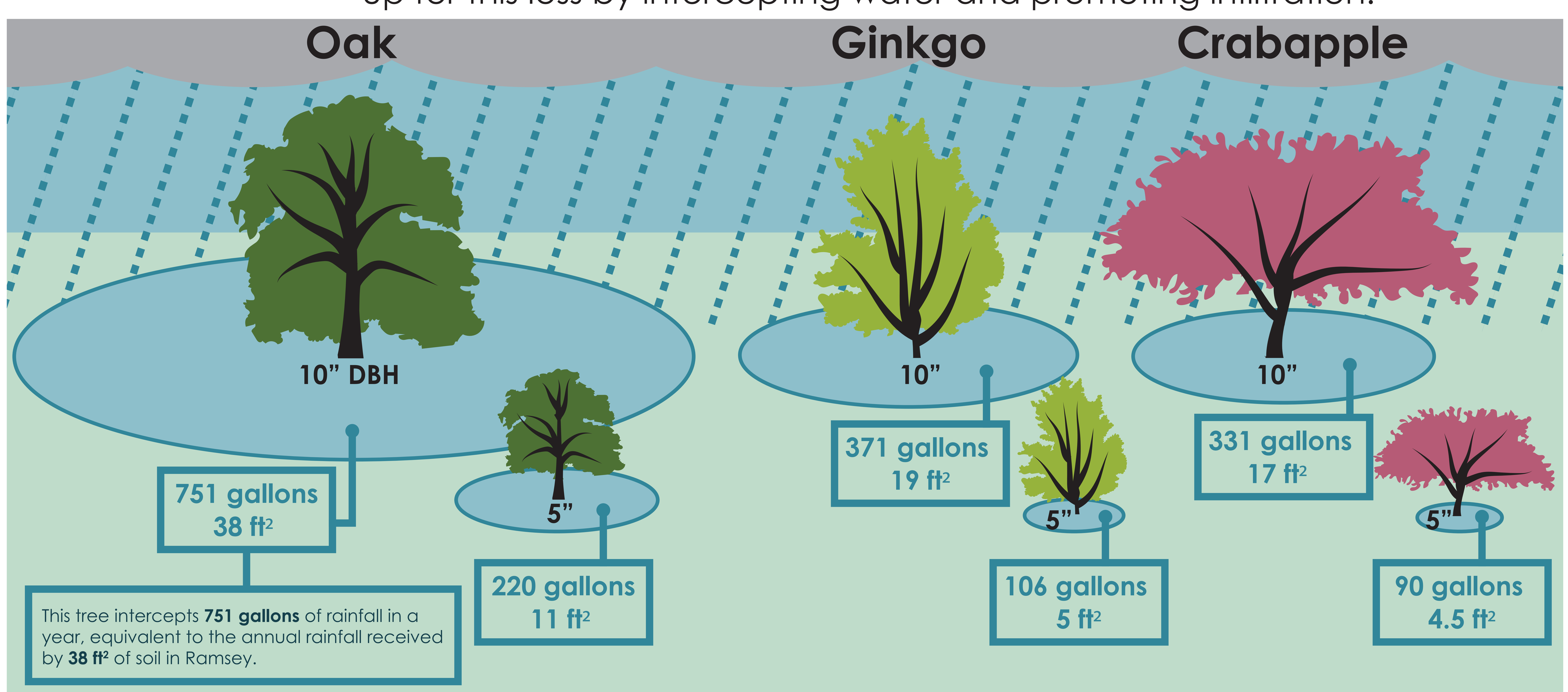
However, **runoff contaminates surface water** when it carries oil, litter, and other pollutants. Trees improve stormwater management by promoting infiltration (movement of water into soil), which helps **filter pollutants** and **recharge aquifers**.

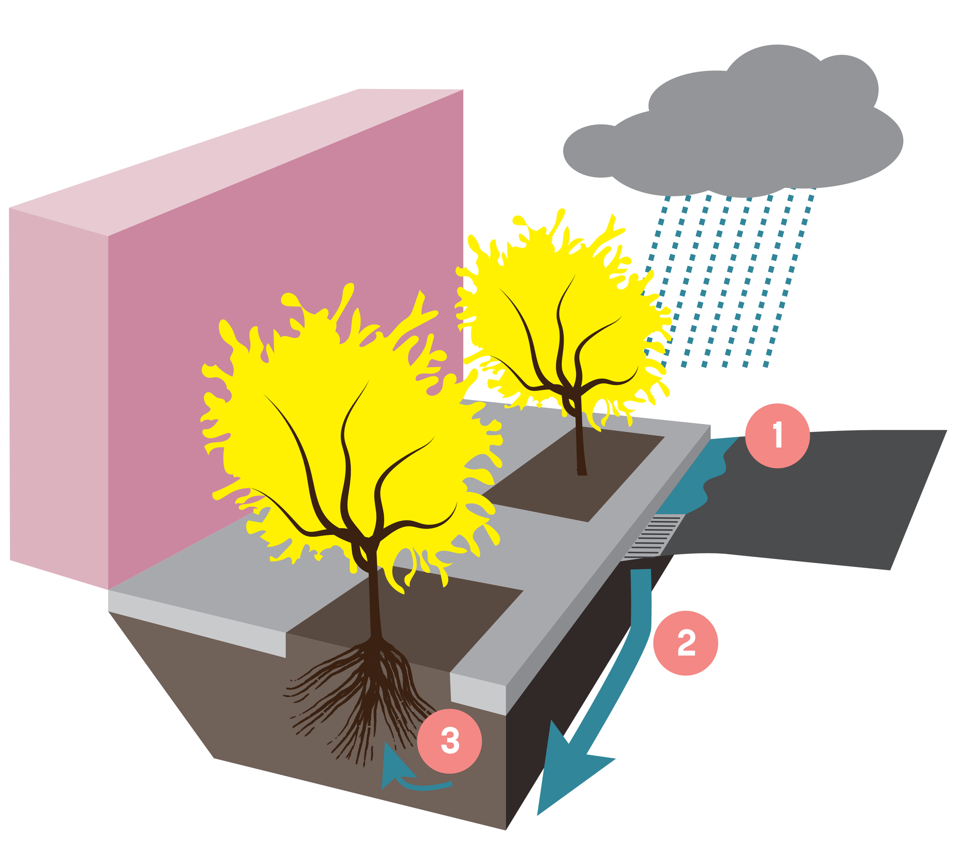
Rainfall Interception

A tree will absorb more water as its **Diameter at Breast Height (DBH)** increases. However, **water interception also varies by species.** In areas that experience heavy runoff, oaks would be effective at intercepting large volumes of water. However, **oaks grow large** and may not fare well in narrow spaces. **Ginkgos** can grow large, but they are **slower-growing** and would be more appropriate in **confined spaces.** In small planting spaces with less runoff, **small trees like crabapples** would be a good alternative.

Annual Rainfall

More development means less surface soil for water infiltration; trees make up for this loss by intercepting water and promoting infiltration.



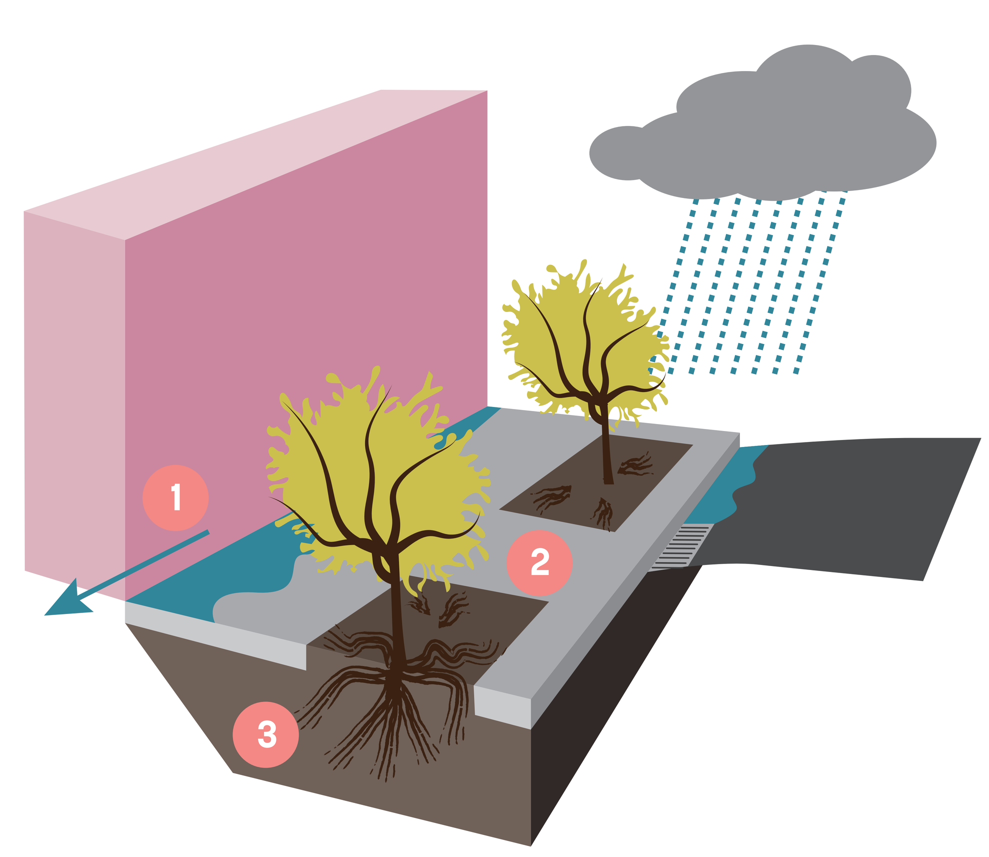


Prototypical perspectival section

Stormwater Flow

1. Stormwater flows into inlet
2. Water distributes and infiltrates through soil
3. Tree roots take up and hold water

Filtered and excess water flows through pipes into the stormwater sewer.



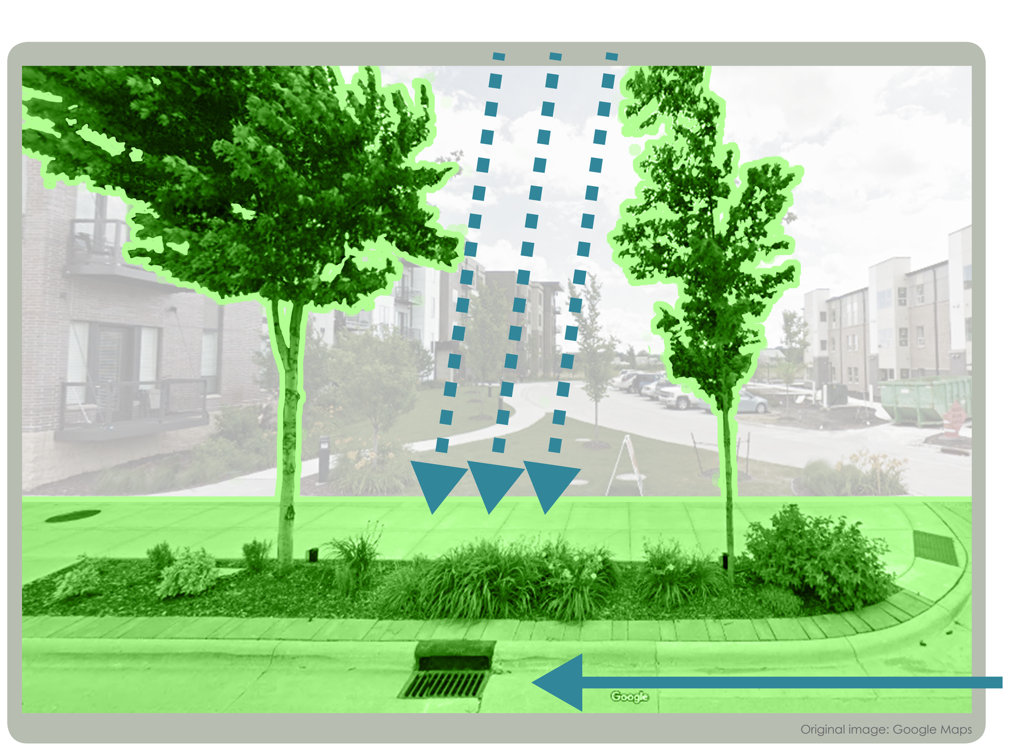
Prototypical perspectival section

Common Issues

1. Water pools away from drainage sites
2. Trees lacking moisture and oxygen send roots to the surface
3. Compacted soil and insufficient root space prevents stormwater absorption

Trees underperform in poor site conditions

Optimizing Stormwater Systems



In the COR, tree pits combine with planters, and these connect to stormwater sewer inlets. This maximizes the runoff capture from direct rainfall and inlet flow.

Permeable pavers enhance street tree systems by allowing water to pass through small spaces in the sidewalk. This ensures that more water moves into the soil instead of pooling away from trees.

Trees Protect Our Cities from Storms

No one wants to be caught unprepared in a rainstorm. Fortunately, street trees are on the first line of defense when it comes to **intercepting stormwater pollutants**. Next, we see how Ramsey can utilize street trees to **improve air quality by filtering pollutants and reducing pollutant emissions.**

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Air Quality

Breathing Cleaner Air

Trees in urban areas significantly affect local and regional air quality. It is commonly known that trees **release oxygen** and **capture carbon dioxide**, but the impact of trees on urban air quality is broad and complex. Trees alter the urban atmosphere and affect air quality in cities by **reducing temperatures**, **removing air pollutants**, changing building energy use, and releasing volatile organic compounds. Using a tree inventory, city officials can improve the air quality within their cities and build healthier communities by planting tree species that reduce the formation of smog.

Temperature Reduction

Air temperature decreases when trees transpire and water vapor from their leaves is released into the atmosphere. By reducing air temperatures, **trees provide cooler summer months**. The **distribution of trees** also **affects temperature,** which is why **an informed and organized tree planting plan** not only **contributes to a healthy** and **well maintained community forest**, but to **increased wellbeing for Ramsey's residents**.

Release of Volatile Organic Compounds (VOCs)

Some tree species are better suited for congested streets as they can **reduce the formation of smog**. Although trees give off chemicals called volatile organic compounds (VOCs), tree species differ in the amount of VOCs they emit. Cities should plan ahead to plant lower emitting VOCs trees along streets with heavy traffic.

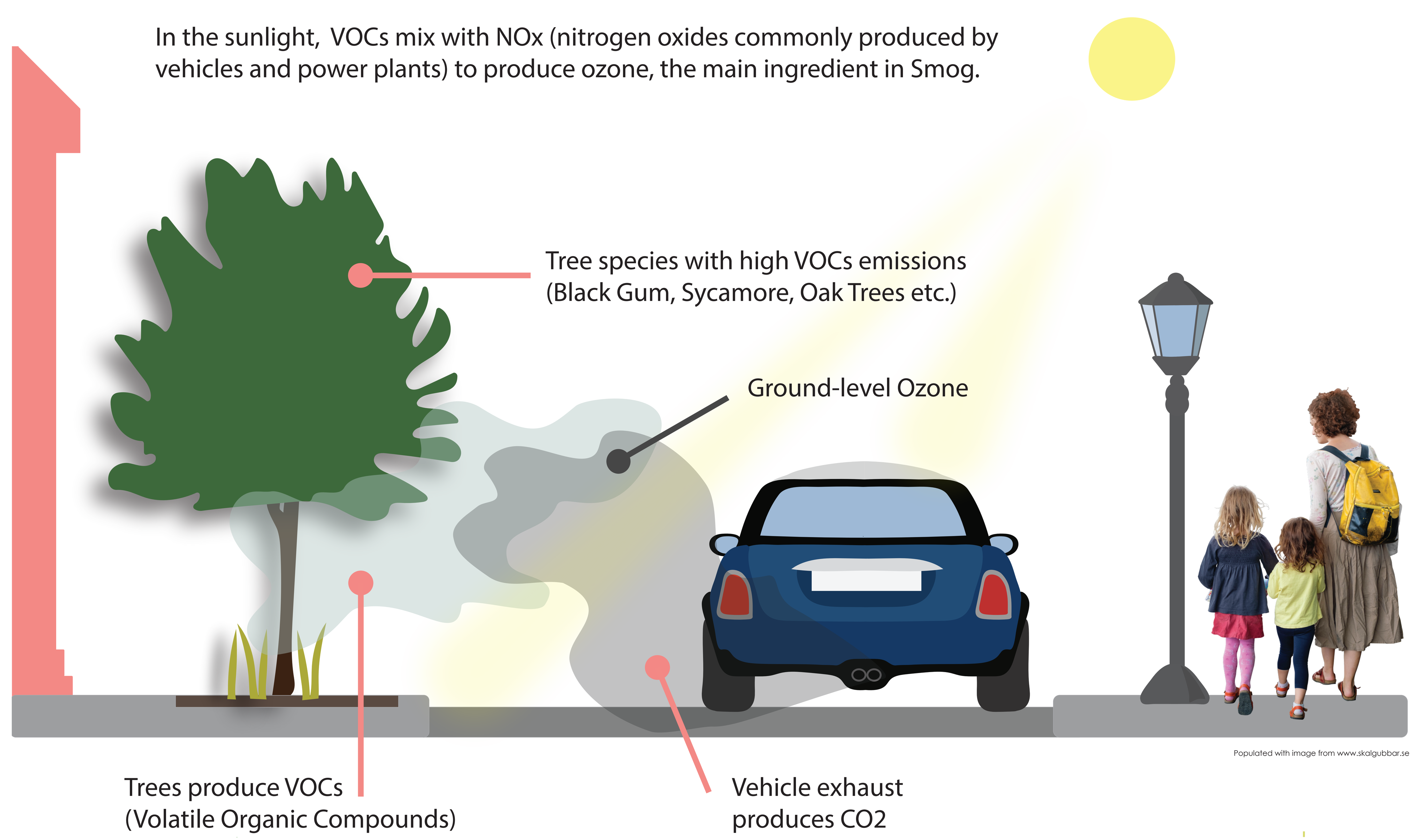
Removing Air Pollutants

Trees remove air pollution by intercepting and absorbing airborne particles.The larger tree canopy cover a city has, the greater total pollution removal.

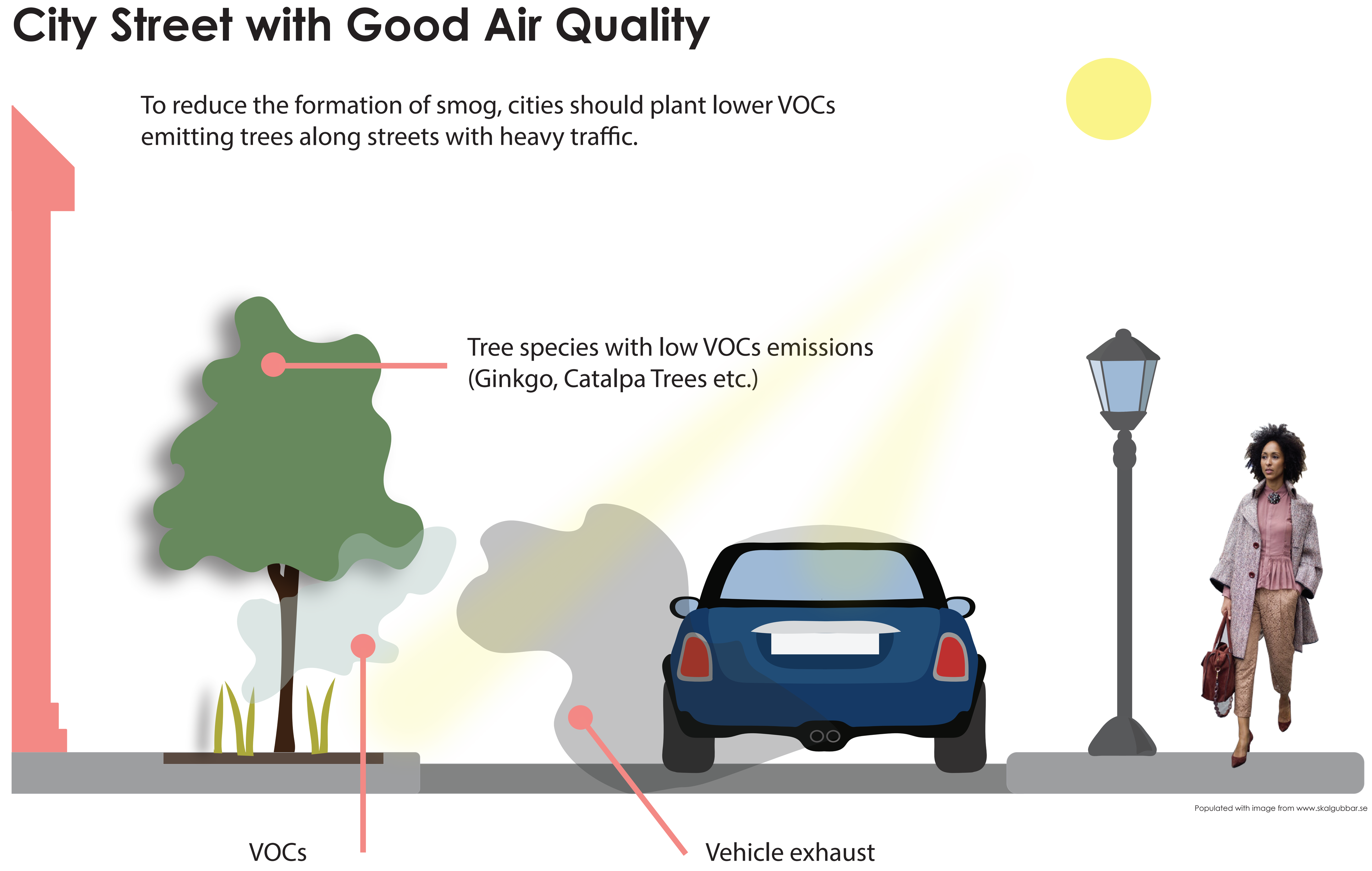
Changing Building Energy Use

Trees change building energy use by providing shade during the summer and blocking winds during the winter. As a building's energy use lowers, so do the pollutants being emitted. **Improper tree placement** can lead to **higher utility bills**, so Urban Forest Management allows cities to maximise tree's energy conservation benefits.

City Street with Poor Air Quality



City Street with Good Air Quality



Tress Make Clean Air

As the number of cars and industries in Ramsey grows, **strategic tree planting initiatives** could **reduce carbon emissions** and **prevent respiratory diseases** . Planting trees with low VOCs emissions in congested streets ensures the amount of airborne chemical in the atmosphere remain low. Likewise, **an informed plan for tree planting guarantees economic returns** for the city and its residents by **raising property values**.

Energy + Property

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Nowak, D. J., Greenfield, E. J., Hoehn, R. E., & Lapoint, E. (2013). Carbon storage and sequestration by trees in urban and community areas of the United States. *Environmental Pollution 178*, 229-236. Retrieved from http://dx.doi.org/10.1016/j.envpol.2013.03.019

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Energy + Property

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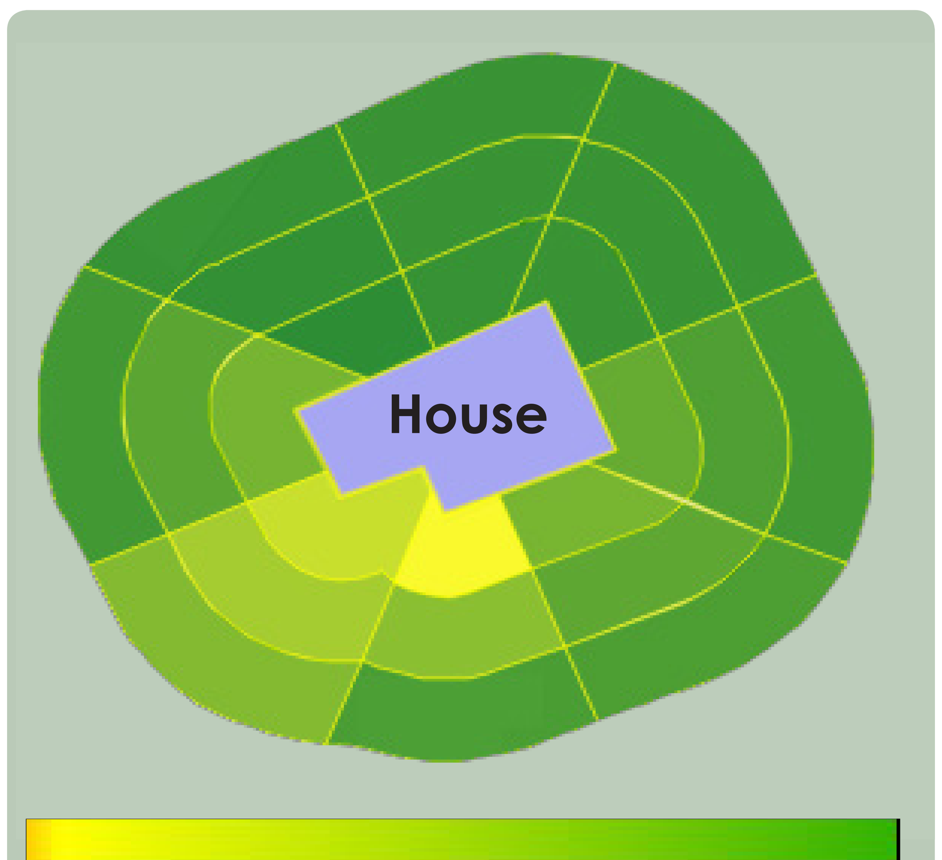
Reducing Energy Expenses

Trees planted in a strategic manner are able to conserve energy for homes and reduce energy bills. In the summer, the leaves of trees provide shade that will reduce the amount of air conditioning a house will use. In the winter, deciduous trees allow more sunlight into homes, which can reduce the amount of heating that is needed. Trees that are planted to the south are the least prioritized. Trees that give shade to an air conditioner can increase the efficiency by 10%. This type of strategic planning is called smart landscaping.



Less Desirable Tree Planting

More Desirable Tree Planting

Digital Resource: i-Tree

i-Tree is an easy to use online application that can provide essential information to Ramsey officials and their residents. The picture to the left depicts a function of i-Tree, it shows where it is most beneficial to plant a tree on a specific property. i-Tree can also determine the money saved from the existing trees.

The U.S. Department of Energy predicts that the proper placement of only 3 trees can save an average household between $100 and $250 in energy costs annually. Evergreen trees are beneficial to plant in areas that will not shade the home in the winter, but will serve as a windbreak. On average, evergreen trees that are placed property as a windbreak will decrease a home's fuel consumption by 25%.

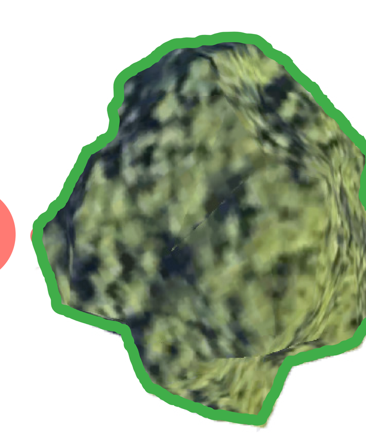
The energy savings from the street trees in the above photo total $41.34 in 2017. As these trees mature, their canopy will increase which will result in higher savings.

Adding to Property Values

Street trees increase the property values of every property. The trees bring an aesthetic appeal along with their other benefits, which can increase the value of the property. The U.S. Forest Service estimates that mature street trees can increase a property's value by 10% on average. As property values increase then the revenue that is acquired from taxes will increase as well bringing more money into the local municipality.

1.7 days + $88

Homes that are within 100ft of a street tree have an average reduction of 1.7 days on the market which adds $88 on average to the selling price.

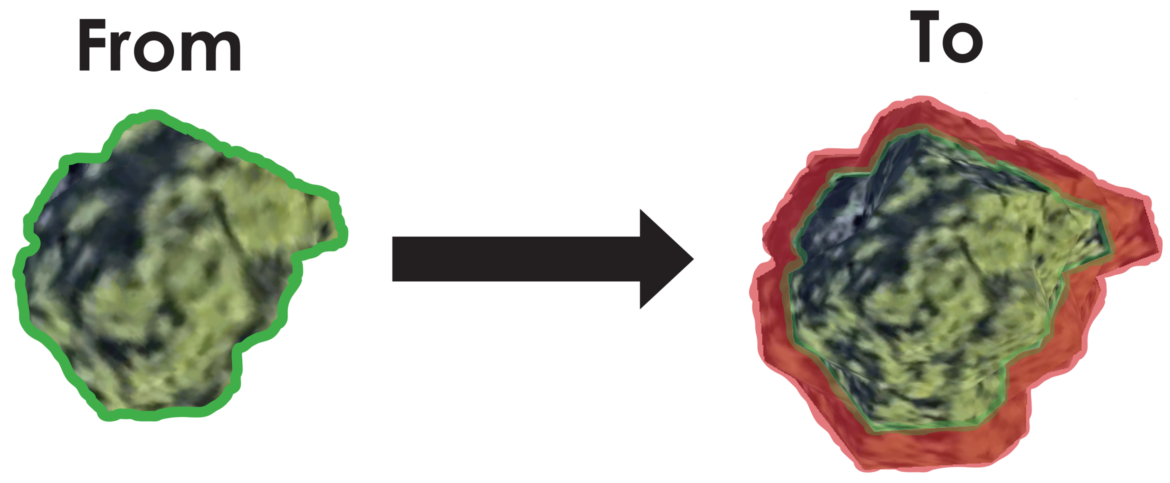


= $7,000

A mature street tree that has a 300 square foot canopy cover can add approximately $7,000 to the property value.

From

To



10% tree canopy cover increase = $1,371

A study done in Ramsey and Dakota counties concluded that a 10% increase in tree cover that is within 100m of a house will add approximately $1,371 to the market value.

Trees Save Energy and Add Property Value

Street trees provide energy savings and increase property value, most notably in the residential areas. i-Tree is an easy and informative tool that residents in Ramsey can use to maximize the benefits of planting trees on their property. The benefit of street trees that is most evident is the added vibrancy and health to the community.

Community

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Community

Creating Vibrant Community

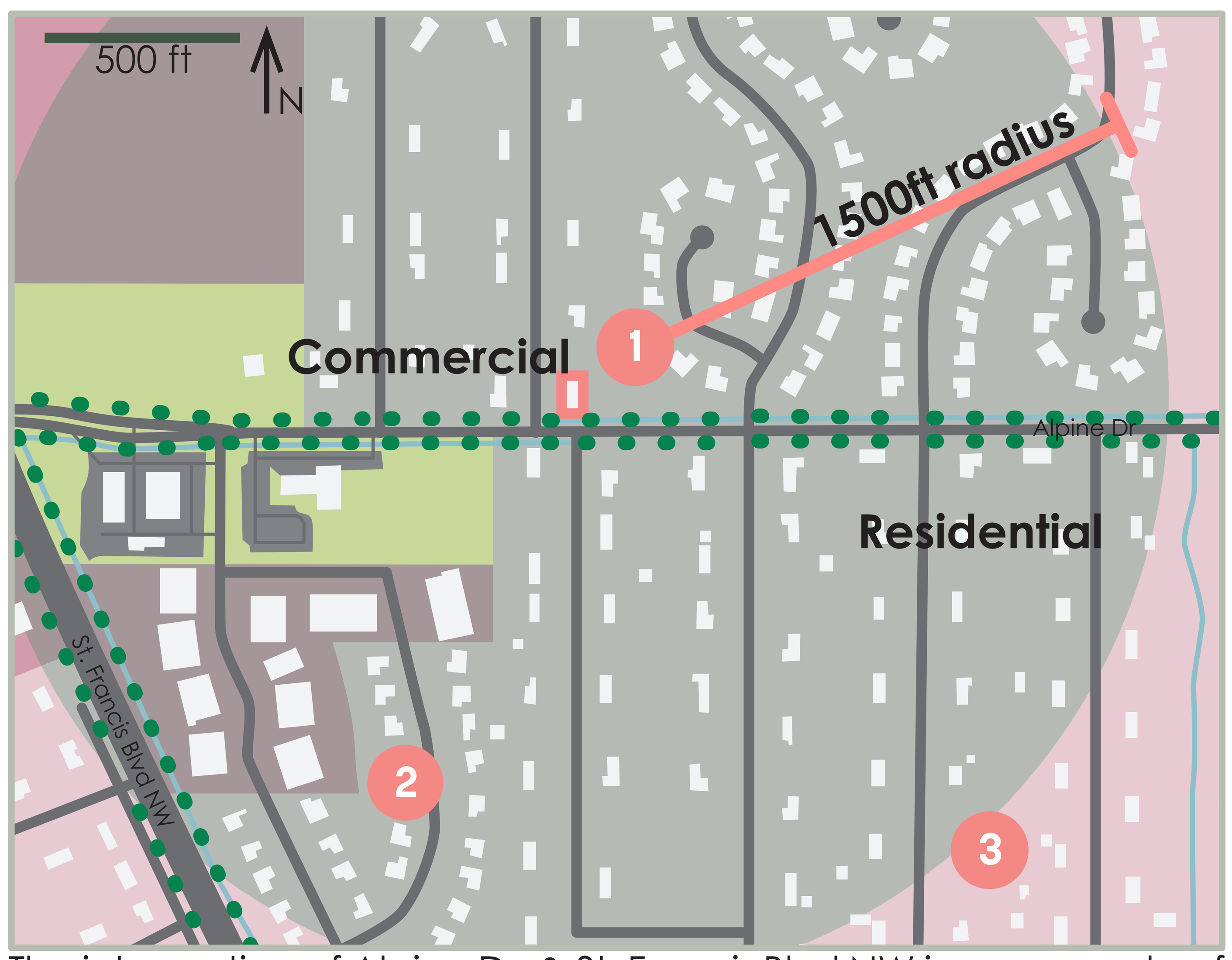
The long-lasting benefit of street trees is that they add to a more vibrant and healthy community. Street trees impact how people interact with, move through, and perceive their environment. As Ramsey grows, it is important that residents and visitors continue to feel **safe**, **connected**, and **comfortable**. The community will experience big changes as Ramsey develops, and the city can proactively support this transition with street tree planting solutions.

Tree Attraction

In spaces where commercial and residential uses overlap or are proximal, **street trees help mediate the relationship between places that would otherwise be in conflict.**

Street trees can impact driving behavior and route choice, and they can be used to **attract people to retail, restaurants, and other destinations.**

Residents will also have a **higher quality of life** in neighborhoods with dense street tree planting.



The intersection of Alpine Dr. & St. Francis Blvd NW is an example of adjacent commercial and low-density residential uses in Ramsey.

1 Because it generates traffic, nearby retail reduces neighborhood satisfaction for residents living in single-family homes; for these residents, trees within 1500ft **improve satisfaction.**

Ramsey, MN. Original image: Google Maps

2 More than half the time, local residents will **choose scenic driving routes** over faster routes. Planting trees on arterial roads can mitigate thru-traffic on residential streets.

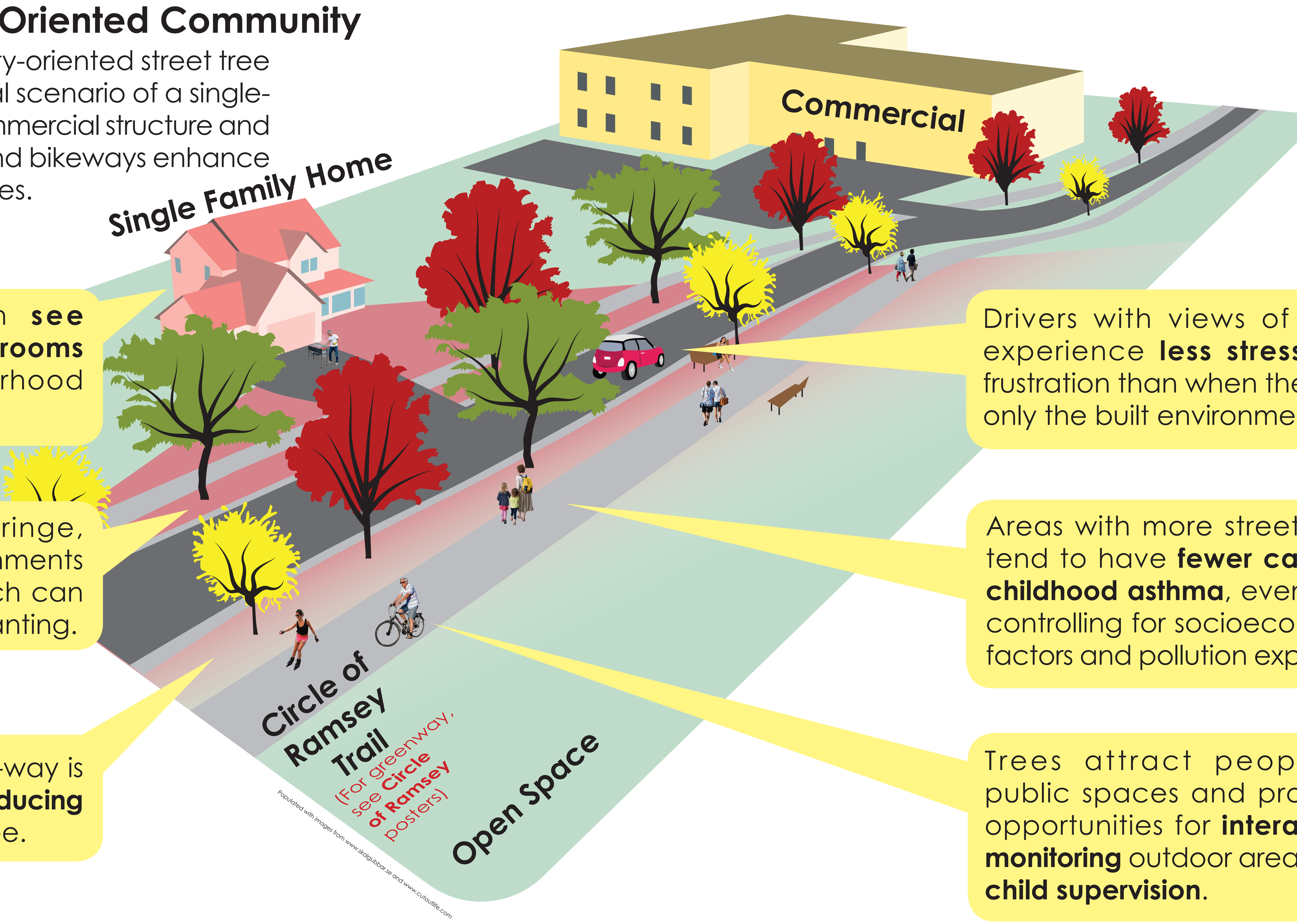
Maple Grove, MN. Original image: Google Maps

3 On suburban roads, people **drive slower** where there are street trees.

Hopkins, MN. Original image: Google Maps

Envisioning a Tree-Oriented Community

An example of community-oriented street tree planting in a hypothetical scenario of a single-family home next to a commercial structure and open space. Sidewalks and bikeways enhance the functions of street trees.



Residents who can **see trees from their living rooms** have higher neighborhood satisfaction.

On the rural-urban fringe, residents prefer environments of **rural character**, which can be evoked with tree planting.

A public tree in right-of-way is 40% more effective at **reducing crime** than a private tree.

Drivers with views of trees experience **less stress** and frustration than when they see only the built environment.

Areas with more street trees tend to have **fewer cases of childhood asthma**, even after controlling for socioeconomic factors and pollution exposure.

Trees attract people to public spaces and promote opportunities for **interaction**, **monitoring** outdoor areas, and **child supervision**.

Trees Create Communities

Trees bring communities alive by enhancing the experiences of residents and visitors. They promote the **well-being of all people**--drivers and pedestrians, young and old, locals and out-of-towners. Next, we will learn the **benefits and disadvantages of planting specific kinds of trees** on Ramsey streets.

Diversity

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Diversity

Good planting for a growing city starts with putting the right trees in the right places

A **tree inventory** will provide the City of Ramsey with **valuable information** to **guide future tree planting initiatives**. It is crucial cities undertake **tree planting programs** to **maximize the ecosystem services** trees provide and **prevent economic losses**. However, it is equally important to assess the diversity of a city's Urban Forest to select tree species that can adapt and bring benefits to their surroundings. Cities, businesses, and community members can determine the best trees for planting based on tree qualities (e.g. shading, ornamentation) as well as restrictions on planting conditions (e.g. soil type, limited space). **Below we show the Tree species in Ramsey.**

Catalpa (genus *Catalpa*)

Original image: http://bit.ly/2krVj65

Benefits:
- Fast growth rate
- Adapts to urban stress
- Tolerates air pollution and drought
- Shading canopy
- Fragrant blossoms

Weaknesses:
- Weak structure
- Falling flowers and fruit need clean-up
- Threatened by verticillium wilt, leaf spots, and powdery mildew

Traits:
- Bean-like seed pods
- Large leaves
- Irregular crown
- Height: 60'
- Canopy: 25'

Catalpas are resilient, but they require cleanup.

Crabapple (genus *Malus*)

Original image: http://bit.ly/2BOTDYw

Benefits:
- Low maintenance
- Adapts to urban stress
- Tolerates salt, alkaline soil, and drought
- Profuse spring flowering

Weaknesses:
- Susceptible to disease and fungus, including fireblight and scab
- Requires full sun

Traits:
- Dense, rounded tree
- Grows small fruit
- Height: 30'
- Canopy: 20'

Crabapples fare well in urban conditions and are low-maintenance.

Ginkgo (genus *Ginkgo*)

Original image: http://bit.ly/2AWadrY

Benefits:
- Low Maintenance
- Adapts to urban stress
- Tolerates air pollution, salt, aconfined spaces
- Grows in alkaline, acidic, and compacted soil
- Shading canopy
- Leaves turn bright yellow in fall

Weaknesses:
- Slow growth rate
- Requires full sun

Traits:
- Short branches
- Fan-shaped leaves
- Height: 80'
- Canopy: 30'

Ginkgos adapt well to the city, although they are slow-growing.

Maple (genus *Acer*)

Original image: http://bit.ly/2iukuk9

Benefits:
- Native species
- Adapts to urban stress
- Tolerates drought
- Grows in alkaline and anaerobic soil
- Shading canopy
- Colorful fall foliage

Weaknesses:
- Limited tolerance to compaction, salt, and confined spaces
- Branch loss
- Weakened by the Asian Longhorned Beetle

Traits:
- 5-lobed leaves
- Round/oval growth
- Height: 50'-90'
- Canopy: 35'-40'

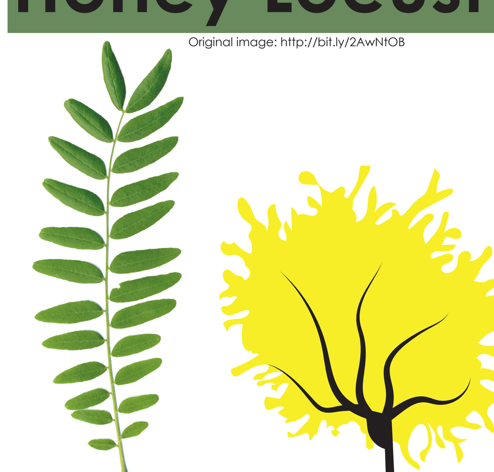
Maples are attractive shading trees, but they are sensitive to site conditions.

Trees in Ramsey

Cities should follow the **10-20-30 guide** for tree planting: no more than **10% any species**, no more than **20% of any genus**, and no more than **30% of any family**. This is crucial for urban forest resilience against disease and invading insects. Ash trees (bottom right) are not recommended for new planting due to the prevalence of Emerald Ash Borers.

Honey Locust (genus *Gleditsia*)

Original image: http://bit.ly/2AwNtOB



Benefits:
- Native species
- Fast growth rate
- Adapts to urban stress
- Tolerates salt and drought
- Grows in alkaline soil
- Strong branches
- Colorful fall foliage

Weaknesses:
- Susceptible to insect attacks
- Pods require clean-up

Traits:
- Compound leaves
- Height: 70'
- Canopy: 40'

Honey Locusts are fast-growing and adaptable, but require clean-up.

Elm (genus *Ulmus*)

Original image: http://bit.ly/2AV7j6P

Benefits:
- Native species
- Moderate to fast growth rate
- Adapts to urban stress
- Tolerates of salt, moisture, drought, and wind
- Shading canopy

Weaknesses:
- Requires full sun
- Susceptible to Dutch Elm Disease

Traits:
- Toothed leaves
- Umbrella-like crown
- Height: 70'
- Canopy: 40'

Consider planting Elm varieties that are resistant to Dutch Elm Disease.

Oak (genus *Quercus*)

Original image: http://bit.ly/2AyQNsD

Benefits:
- Native species
- Fast growth rate
- Adapts to urban stress
- Tolerates pollution
- Grows in most soil textures
- Colorful fall leaves

Weaknesses:
- Intolerant of salt
- Requires full sun
- Susceptible to Oak Wilt

Traits:
- Narrow crown
- Large acorns
- Height: 80'-100'
- Canopy: 40'-60'

Oaks need space and should be planted apart to prevent the spread of Oak Wilt.

Ash (genus *Fraxinus*)

Original image: http://bit.ly/2zUKCf2

Benefits:
- Native species
- Fast growth rate
- Tolerates salt
- Grows in compacted and alkaline soil
- Shading canopy
- Tough, elastic wood

Weaknesses:
- Lower tolerance for drought conditions
- Requires full sun
- Threatened by the Emerald Ash Borer

Traits:
- Compound leaves
- Rounded crown
- Height: 65'-90'
- Canopy: 20'-40'

Ash trees should not be newly planted due the threat of Emerald Ash Borers.

Tree Diversity Matters

No two trees are alike, and cities that respect these differences will achieve successful street planting projects. **Planting diverse trees** that are appropriate for site conditions **ensures a resilient urban forest** yielding **diverse benefits**. In the following poster, we will assess and evaluate the population of street trees in the COR along Sunwood Dr. in Ramsey.

Methods

PA 5211 Land Use Planning • TEAM: Ada Moreno Gomez, Nick Kieser, Victoria Dan • **INSTRUCTOR:** Fernando Burga, Ph.D.

Resilient Communities Project

University of Minnesota Driven to Discover

City of Ramsey

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Investing in Ramsey's Streetside Urban Forest

8

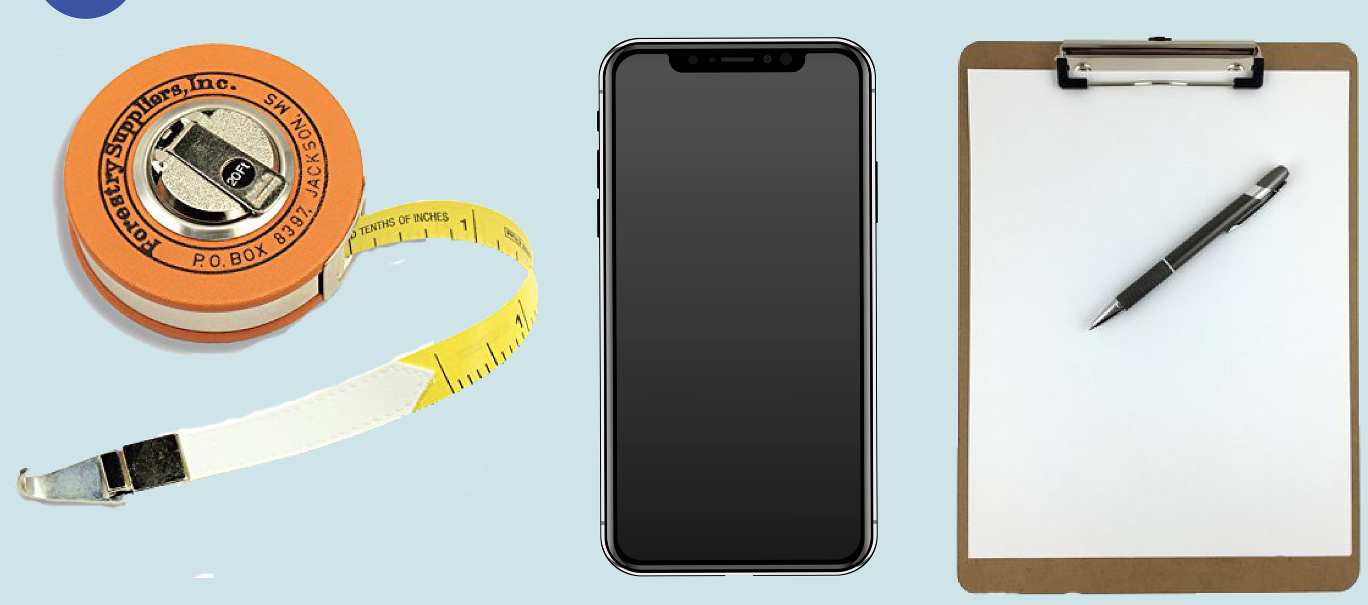
Methods

Methods

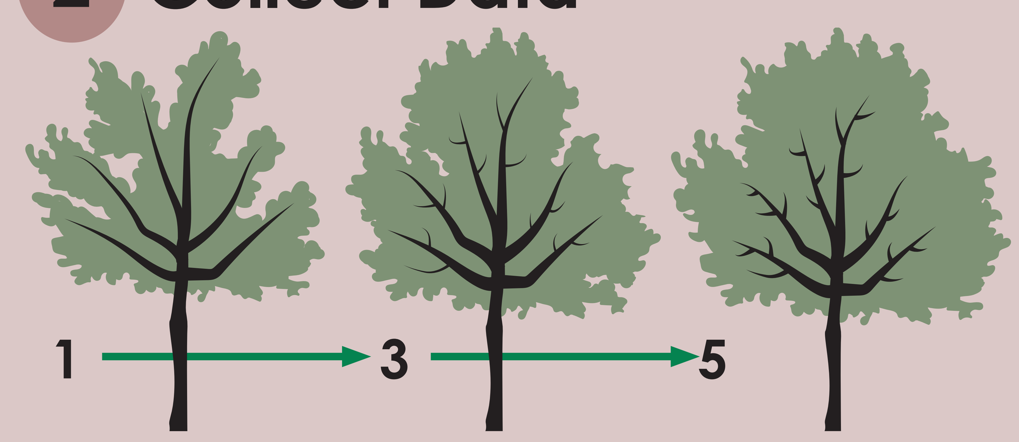
how we completed the COR and residential tree inventories

For our tree inventories we collected data on a total of 130 trees along the COR and in a residential neighborhood. For each tree we collected the diameter at breast height (DBH), geographic coordinates, tree species, and the quality of the canopy cover. Once the data was collected, we calculated the age, size and monetary benefits for each tree. The data that we collected for each tree inventory can be seen on the next two posters. **Our methods for data collection can be used as a model for future tree inventories in Ramsey at more locations.**

1 Gather Tools

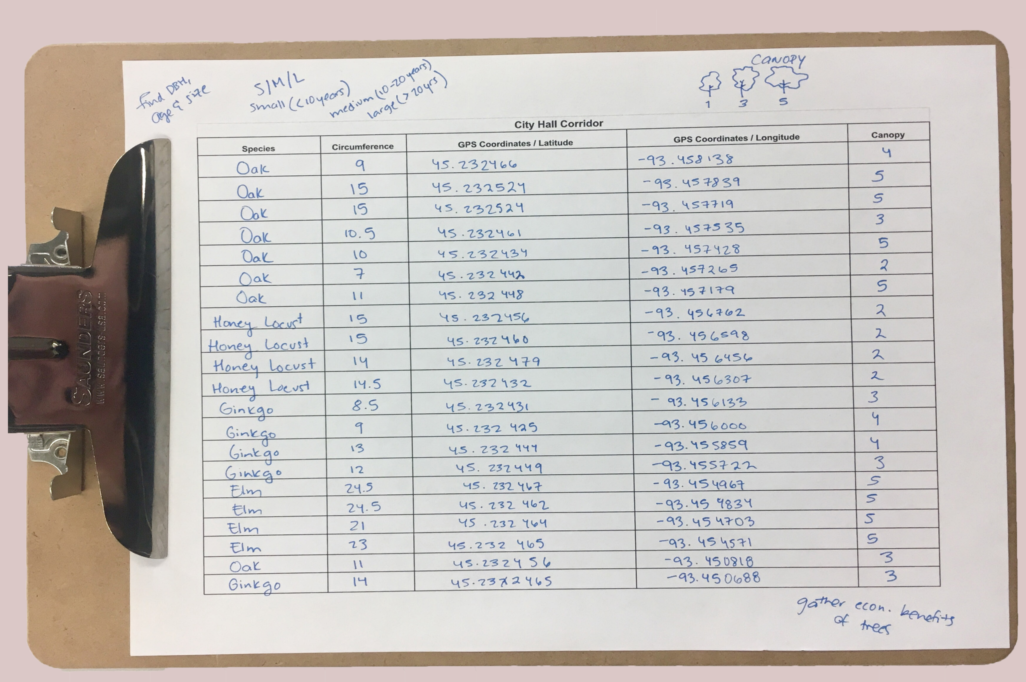


2 Collect Data

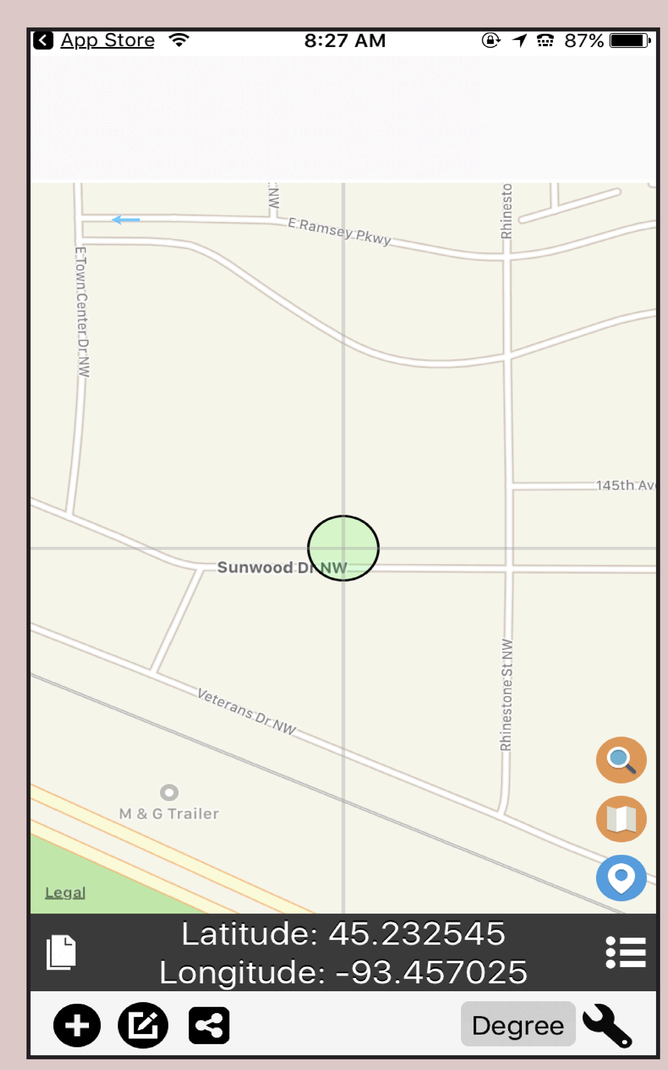


These trees show the difference between high and low quality canopy cover. In our inventories, we used a rating scale of 1-5. **The trees with a higher quality canopy cover maximize the benefits.**

The ruler that we used is called a diameter tape. This tape is used by foresters to determine **DBH**.



The two pictures above show our completed data collection forms. **The pictures show the forms we filled out to address tree species, DBH, coordinates and the tree canopy cover quality.** Once we had our field data we transferred the data into an excel sheet. With this data, we calculated the age and averages of the diameter and canopy cover quality. We also calculated the monetary value for each tree in our inventories which led to our average monetary value for each tree for the area.



To determinine the location of each tree, we used a coordinate system app on our smartphones. The app is called *Coordinates* and can be found in the iPhone app store. In future tree inventories, **we suggest using a GPS locator** rather than this app because GPS locators are able to determine the location of the trees more precisely.

3 Analysis

The two excel sheets to the left show the iteration of our tree inventory data after inputing our data into excel. **The excel sheets also show our calculations for each tree to determine the monetary value, size, age and circumference of each tree.** These sheets only show a portion of the trees that were inventoried.

City Hall Corridor

Species	Circumference	GPS Coordinates / Latitude	GPS Coordinates / Longitude	Canopy	DBH	Overall Benefits per Year	Age	Size
Oak	11	45.23309	-93.461181	4	3.5	$14.00	14	M
Crab Apple	8	45.232433	-93.461467	2	2.5			
Crab Apple	9	45.233275	-93.461734	2	2.9			
Crab Apple	8.5	45.233295	-93.461834	2	2.7			
Crab Apple	10	45.233368	-93.461965	3	3.2			
Maple	10	45.233394	-93.462201	3	3.2	$10.00	18	M
Maple	8	45.23339	-93.462246	2	2.5	$7.00	14	M
Maple	18	45.233508	-93.462648	5	5.7	$28.00	32	L
Maple	16	45.233539	-93.462768	5	5.1	$22.00	28	L
Maple	23	45.23361	-93.462893	5	7.3	$44.00	40	L
Maple	13	45.23361	-93.462948	4	4.1	$15.00	23	L
Maple	10	45.233675	-93.463152	3	3.2	$10.00	18	M
Maple	28.5	45.233716	-93.463320	5	9.1	$62.00	50	L
Maple	19.5	45.233739	-93.463446	5	6.2	$33.00	34	L
Maple	29.5	45.233756	-93.463550	5	9.4	$66.00	52	L
Oak	20	45.233826	-93.463715	5	6.4	$34.00	25	L
Oak	18	45.23386	-93.463833	5	5.7	$28.00	23	L
Oak	21	45.233905	-93.463936	5	6.7	$36.00	27	L
Oak	20.5	45.233955	-93.464048	5	6.5	$35.00	26	L
Oak	21	45.233992	-93.464153	5	6.7	$36.00	27	L
Oak	21	45.234008	-93.464264	5	6.7	$36.00	27	L
Elm	32	45.234131	-93.464724	5	10.2	$68.00	41	L
Elm	32.5	45.23417	-93.464852	5	10.4	$70.00	41	L
Elm	16	45.23421	-93.464943	3	5.1	$23.00	20	M
Elm	18	45.234258	-93.465070	4	5.7	$28.00	23	L
Maple	27	45.234292	-93.465242	4	8.6	$57.00	47	L
Maple	24	45.234328	-93.465374	5	7.6	$47.00	42	L
Maple	22.5	45.23438	-93.465471	5	7.2	$43.00	39	L
Maple	20	45.234514	-93.465722	3	6.4	$35.00	35	L
Maple	21	45.234567	-93.465829	3	6.7	$38.00	37	L
Maple	29	45.234642	-93.465935	3	9.2	$63.00	51	L
Maple	23	45.234688	-93.466066	3	7.3	$44.00	40	L
Maple	28	45.234743	-93.466198	4	8.9	$60.00	49	L
Maple	26.5	45.234807	-93.466295	4	8.4	$55.00	46	L
Maple	28	45.234846	-93.466386	5	8.9	$60.00	49	L
Maple	27.5	45.234906	-93.466478	5	8.8	$59.00	48	L
				Total Benefits		$2,328.00		

Residential Corridor

Species	Circumference	GPS Coordinates / Latitude	GPS Coordinates / Longitude	Canopy	DBH	Overall Benefits per Year	Age	Size
Elm	26.5	45.237919	-93.418367	4	8.4	$68.00	34	L
Elm	24	45.237934	-93.418193	3	7.6	$60.00	31	L
Elm	25	45.418033	-93.418033	3	8.0	$64.00	32	L
Elm	27	45.237940	-93.417880	4	8.6	$70.00	34	L
Elm	32	45.237940	-93.417733	4	10.2	$88.00	41	L
Elm	24.5	45.327947	-93.417561	3	7.8	$62.00	31	L
Elm	26	45.237939	-93.417361	3	8.3	$67.00	33	L
Elm	26.5	45.237984	-93.417209	4	8.4	$68.00	34	L
Elm	30	45.237992	-93.417045	3	9.6	$81.00	38	L
Elm	38	45.237964	-93.416879	4	12.1	$112.00	48	L
Elm	20.5	45.237959	-93.416731	3	6.5	$48.00	26	L
Elm	30	45.237969	-93.416574	3	9.6	$81.00	38	L
Elm	30.5	45.237970	-93.416382	3	9.7	$82.00	39	L
Elm	31	45.237988	-93.416211	2	9.9	$85.00	39	L
Elm	39	45.237954	-93.416050	4	12.4	$115.00	50	L
Elm	45	45.237973	-93.415864	4	14.3	$138.00	57	L
Elm	44	45.237954	-93.415726	4	14.0	$135.00	56	L
Elm	14	45.23799	-93.415210	2	4.5	$28.00	18	M
Maple	5.5	45.238049	-93.415443	1	1.8	$4.00	10	S
Elm	10.5	45.238056	-93.415618	2	3.3	$20.00	13	S
Elm	21.5	45.238069	-93.415756	3	6.8	$51.00	27	L
Elm	22	45.238042	-93.415979	3	7.0	$53.00	28	L
Elm	14	45.238054	-93.416141	1	4.5	$28.00	18	M
Elm	30	45.238099	-93.416520	4	9.6	$81.00	38	L
Elm	42.5	45.238079	-93.416401	5	13.5	$129.00	54	L
Elm	43	45.238058	-93.416579	5	13.7	$131.00	55	L
Elm	32.5	45.23806	-93.416773	4	10.4	$91.00	41	L
Elm	35	45.238043	-93.417310	3	11.1	$99.00	45	L
Linden	14.5	45.23808	-93.417499	4	4.6	$22.00	14	M
Elm	29.5	45.238082	-93.417640	3	9.4	$79.00	38	L
Elm	27.5	45.238053	-93.417789	3	8.8	$72.00	35	L
Elm	28	45.238026	-93.417973	5	8.9	$73.00	36	L
Elm	39	45.238028	-93.417136	5	12.4	$115.00	50	L
Elm	23.5	45.23802	-93.418311	3	7.5	$59.00	30	L
Elm	30	45.238037	-93.418407	4	9.6	$81.00	38	L
				Total Benefits		[illegible]		

The picture above shows Victoria and Ada on Sunwood Drive, completing the COR tree inventory.

Calculating Street Trees

These methods will be built upon by a **class in the spring semester as a part of the RCP projects**. It is important to **keep the methods of Ramsey's tree inventories consistent** so the results are as accurate as possible, so the spring class can evaluate our methods to determine the optimal way to complete the inventories. In the following poster, we will **assess and evaluate the population of street trees** in the COR along Sunwood Drive in Ramsey.

COR Inventory

Money Does Grow on Trees!

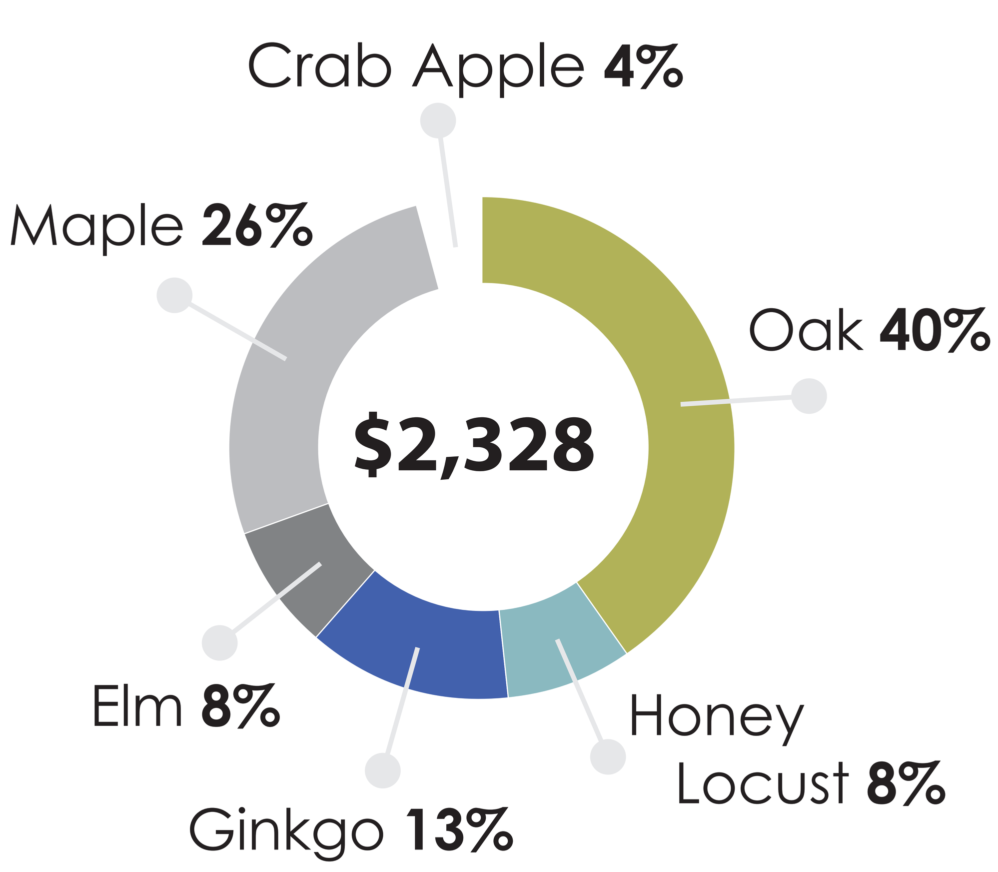
Investing in Ramsey's Streetside Urban Forest

The COR trees as place-makers

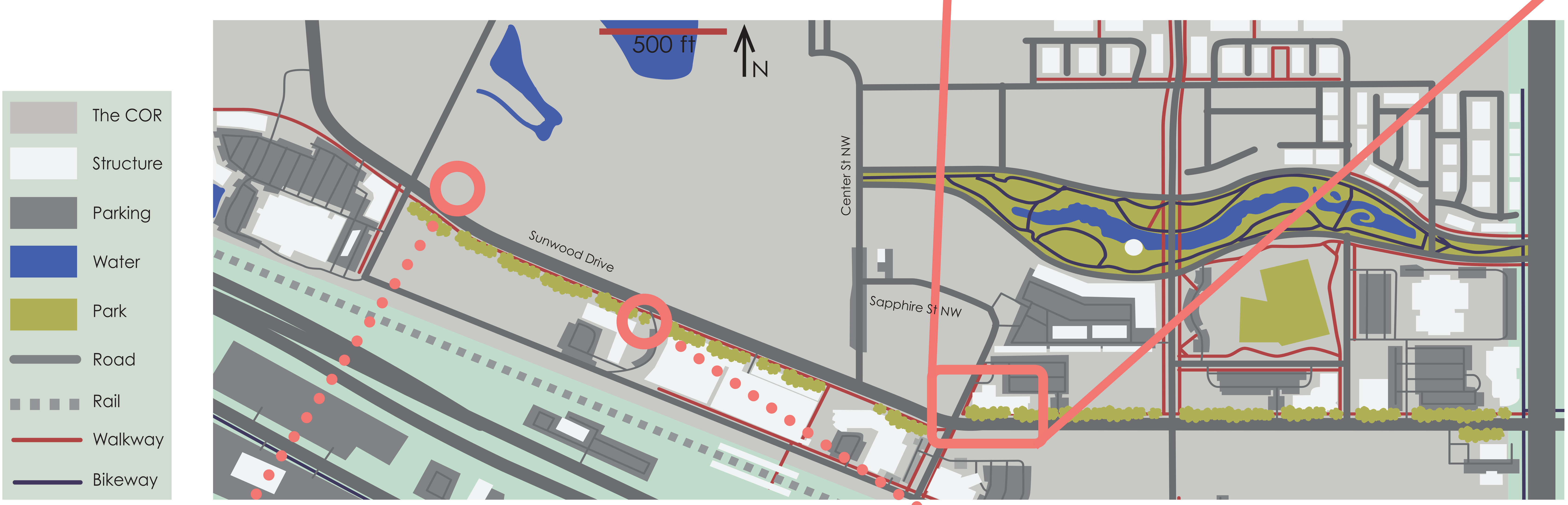
enhance downtown character through diverse street tree planting

A **pilot tree inventory** was taken on **Sunwood Drive** on what is defined as a **'destination street'** throughout The COR. A total of **97 trees** were inventoried comprised of 6 species of trees: t**he Bicolor Oak, Skyline Honey Locust, Ginkgo, Accolade Elm, Sienna Glenn Maple** and **Crabapple**. The trees along Sunwood Drive **provide variety**, **ensuring protection against diseases** and **visual aesthetics** for a street projected to support commerce and attract shoppers and employees. The age of the trees inventoried ranged from 9 to 50 years of age. However, to guarantee trees don't wither and decay at the same time, they should be **planted sparsely**. If a large section of trees reaches the end of its life span at the same time the cost of replacement will be higher for Ramsey.

Tree Diversity on Sunwood Dr.

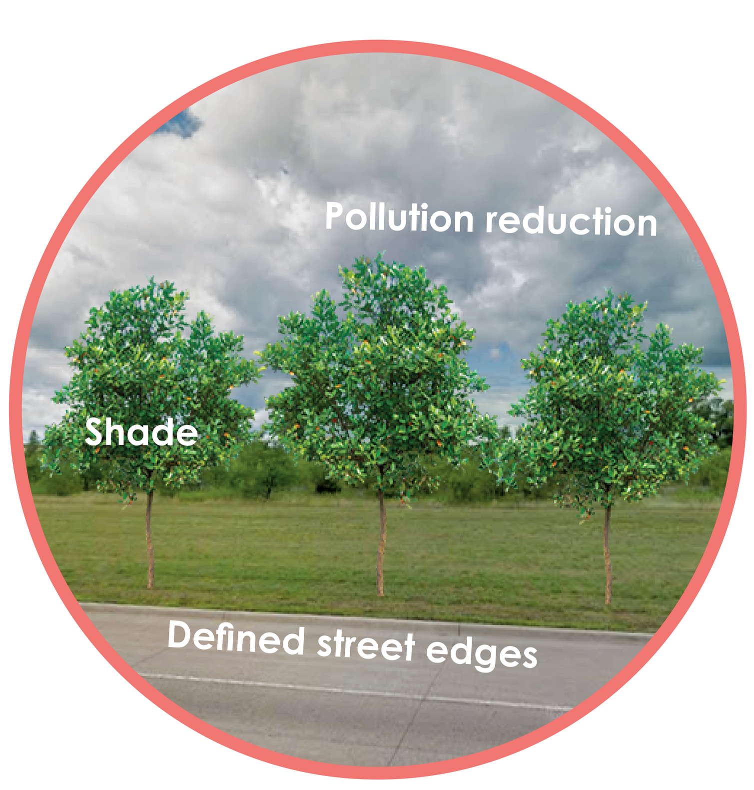


Total Monetary Benefits Per Year	$2,328.00
Average Monetary Benefits Per Tree	$25.58
Average Canopy Quality	3.7
Average Diameter	5.1 Inches



Current View

Future Possibility



Proper placement is vital to enhance the **ecosystem services** trees provide. This young **Oak tree** located in front of **Ramsey's City Hall** provides **aethetic appeal** to destination streets.

Trees Define Destinations

The **97 street trees inventoried** on The COR's Sunwood Drive total **$2,328 in economic benefits** for the City of Ramsey. The trees planted vary in species and age, but as more trees are planted throughout destination and downtown streets, **city officials must consider the lifespan of trees** and their **cost of replacement.** These considerations must also extend to other arteries within the COR, and street planting in residential areas.

Residential Inventory

PA 5211 Land Use Planning • TEAM: Ada Moreno Gomez, Nick Kieser, Victoria Dan • **INSTRUCTOR:** Fernando Burga, Ph.D.

Resilient Communities Project
University of Minnesota
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City of Ramsey

Money Does Grow on Trees!

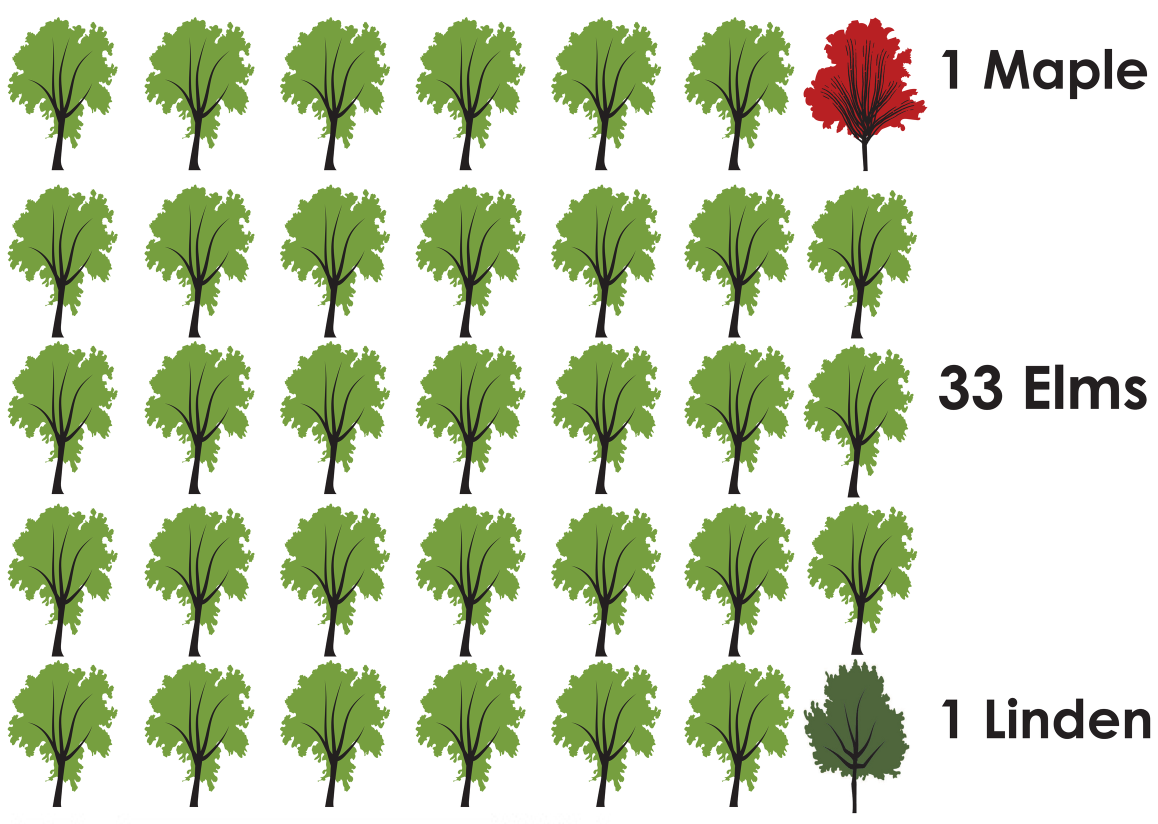
Investing in Ramsey's Streetside Urban Forest

Residential trees as local heritage

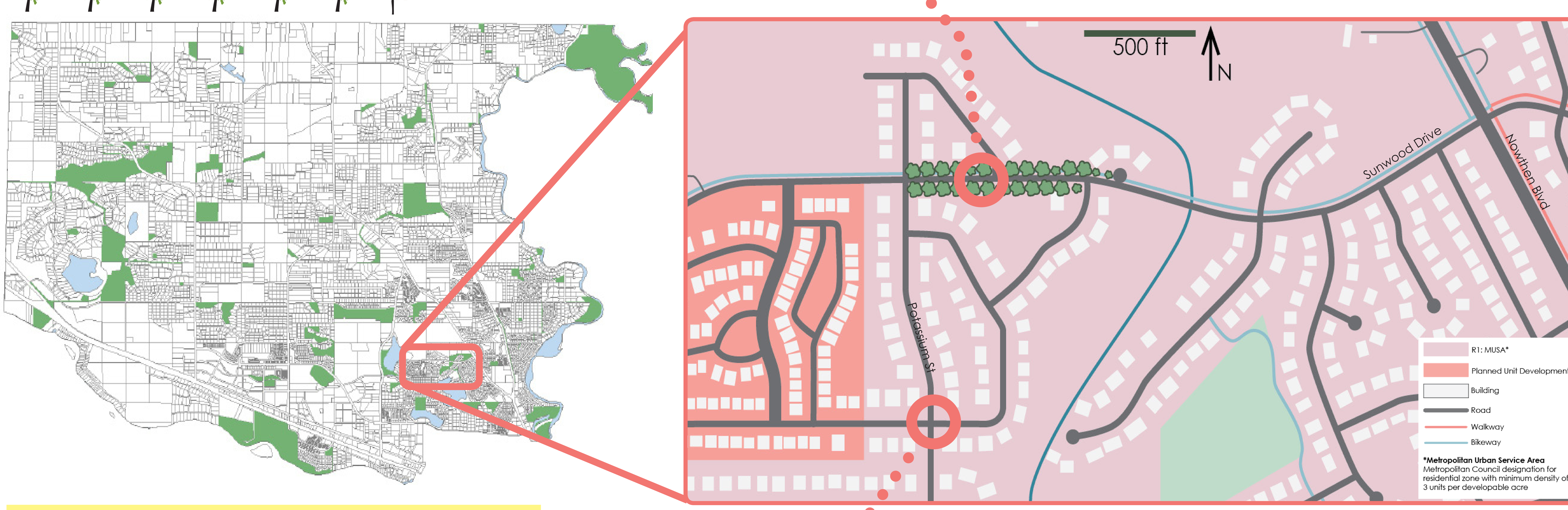
show the lasting benefits of neighborhood street trees

The r**esidential tree inventory** was taken on **Sunwood Drive**, between Potassium Street and 147th Street. The trees in this inventory are more mature compared to the trees in the COR inventory. From this small sample, the **main issue** with the trees in the residential corrior is the **lack of diversity**. The **majority of the trees** sampled were **elms** with **only one maple** and **one linden**. With the **lack of diversity**, there is a **higher chance of all the trees dying** to a species specific disease. If all of the elms died from a disease, then there would be **great financial**, **environmental and social burdens** put on Ramsey to replace those trees.

Tree Diversity between Potassium St. and 147th St.



Total Monetary Benefits Per Year	$2,640.00
Average Monetary Benefit Per Tree	$75.43
Average Canopy Quality	3.4
Average Diameter	8.9 Inches



Sunwood Drive is a good example of a **residential street** that has **good quality mature street trees.** The picture to the right shows Potasium Street south of Sunwood Drive. The benefits that are laid out in the earlier posters show how **residents can benefit from having street trees in their neighborhood**. To maximize the benefits of street trees, there needs to be a **system in place** that plants a more **diverse group of trees** in residential areas. In this small tree inventory, there is an overwhelming number of Elm trees. If a more **diverse group of trees** are planted then there will be **less risk of spreading diseases**.

Current View

Future Possibility

Trees Make a Home

These mature street trees along Sunwood Drive are a good example to show how Ramsey can showcase the benefits of residential street trees. These trees can also show what the future neighborhoods can look like if street trees are planted. A tree inventory is essential for all of Ramsey to calculate the existing tree population and to check the quality of each tree.

Conclusion

PA 5211 Land Use Planning • TEAM: Ada Moreno Gomez, Nick Kieser, Victoria Dan • **INSTRUCTOR:** Fernando Burga, Ph.D.

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Money Does Grow on Trees!

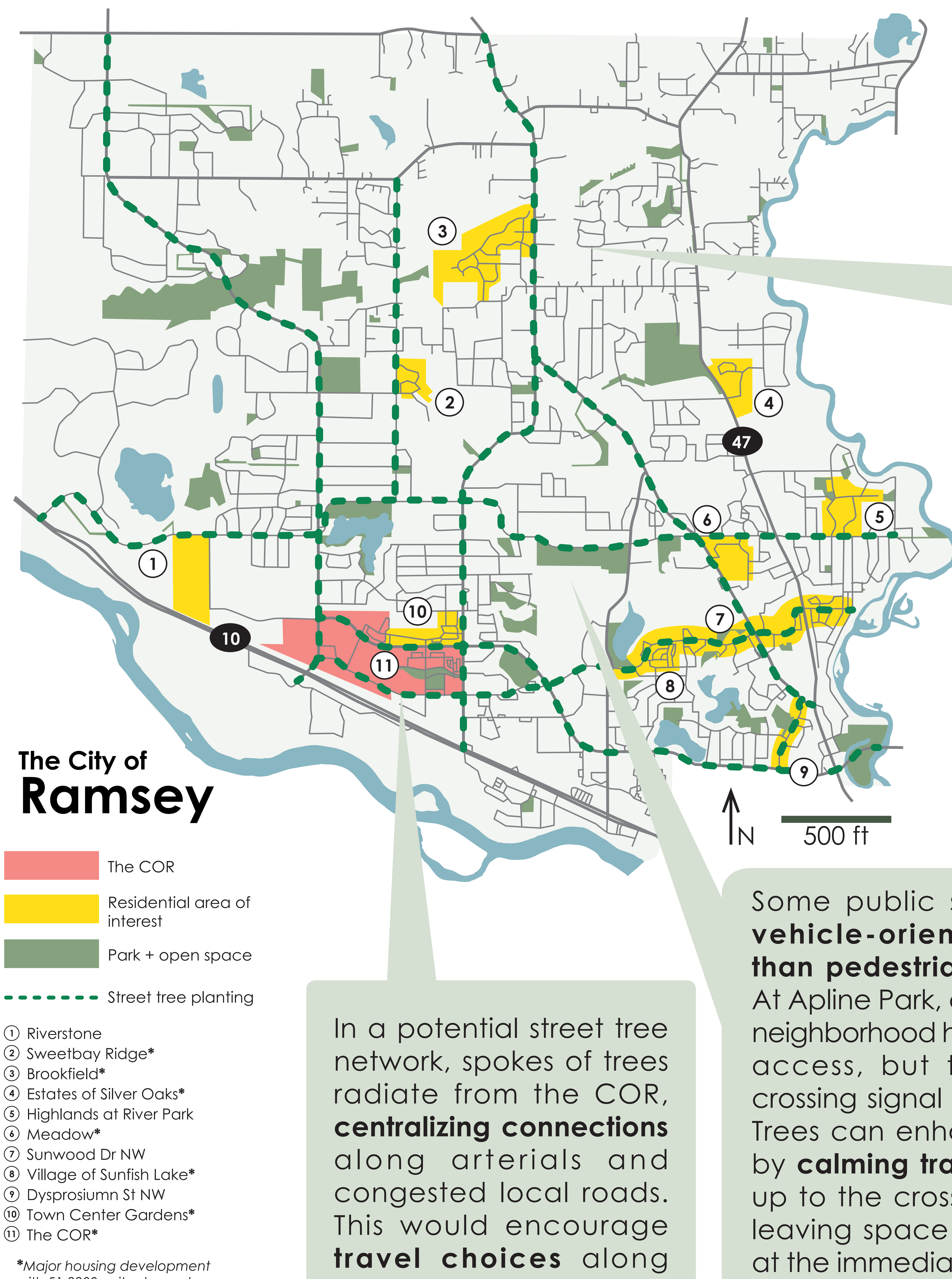
Investing in Ramsey's Streetside Urban Forest

Envision all trees lead to the COR

in a street tree network concept for Ramsey

Each street tree bestows unique benefits, but **collectively a street tree network can create a green roadmap serving an entire community**. Ramsey's most ambitious street tree planting is occuring in the COR, the mixed use downtown development that will provide jobs, housing, retail, and recreation for a growing city. Within a network, street trees would serve as **guideposts for directing movement in and out of the COR**; they would also **construct a spatial narrative about moving and experiencing the city and create Ramsey's identity through place-making**.

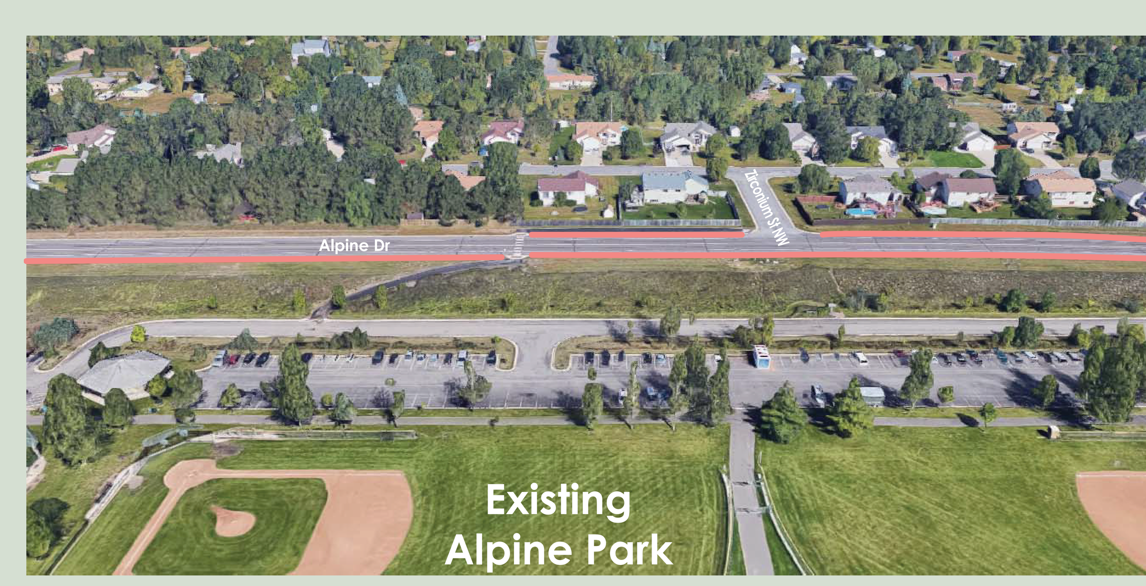
Our conceptualizing of a potential street tree network in Ramsey.



Street trees create **visual transitions** into residential spaces to encourage **safe driving,** promote **outdoor activity,** and **buffer residents from the noise and sight of traffic**. As place-making tools, street trees can enhance the **aesthetic character** of neighborhoods like Brookfield by creating **unique spaces**.

In a potential street tree network, spokes of trees radiate from the COR, **centralizing connections** along arterials and congested local roads. This would encourage **travel choices** along major routes while also generating **traffic calming** benefits.

Some public spaces are **vehicle-oriented rather than pedestrian-oriented.** At Apline Park, an adjacent neighborhood has crosswalk access, but there is no crossing signal or stop sign. Trees can enhance **safety** by **calming traffic** leading up to the crosswalk, while leaving space for **visibility** at the immediate crosswalk area. This approach can be used with streets at **parks, schools, and shopping areas** where pedestrian safety can be improved.



Street trees tell a story: This is Ramsey.

In many ways, Ramsey will **change, grow**, and **mature** as a city. Street trees are a smart investment that generates **savings from ecostystem services** while also **enhancing the social character of a community.** Furthermore, a **network of trees** connects **people to places** as well as **people to ideas** of **identity**, **pride**, and **values** that are vital to a city's integrity.