Planting the Right Tree in the Right Place

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Northern Indiana Public Service Company
NIPSCO, with headquarters in Merrillville, Ind., is one of the seven energy distribution companies of NiSource Inc. (NYSE: NI). With more than 786,000 natural gas customers and 457,000 electric customers across the northern third of Indiana, NIPSCO is the largest natural gas distribution company, and the second largest electric distribution company, in the state. NiSource distribution companies serve 3.8 million natural gas and electric customers primarily in seven states.
Trees + Power Lines

- Major Cause of Outages
- Safety Hazard
- Reliability
- Affects Communities
Safety

- Safety for people
- Safety for workers
- Safety for the equipment
Reliability

- People like having power
- Electricity is critical to many of our daily functions
Our Work Standards

Overall Assessment

Line Clearance Specifications by Voltage

Impact of trimming on health of tree

Tree Replacement Program
Tree Line USA

One of 2 utilities in the nation that has been a member since program’s start.
Why is this important?

Meeting the 5 standards increases communication and cooperation between Utilities, Communities, and other stakeholders.

- 1. Quality Tree Care
- 2. Annual Worker Training
- 3. Community Tree Planting/ Public Education
- 4. Provide a Tree based Energy Conservation Program
- 5. Provide an Arbor Day Celebration
What We Do and Why We Do It

Arbor Day Programs for Communities and Schools

“Cool Communities”- Award winning Energy Conservation Program

Tree Replacements

Community Planting Projects

Sponsor Cities for “Tree City USA” applications
NIPSCO Clearance Requirements
for Roadside Lines

• Distribution 7.2 – 12.5 kV – minimum 10 ft.
• Sub Transmission 34 – 69 kV – minimum 20 ft.
• Transmission 138 kV – minimum 28 ft.
The UGLY:
Removal of White Pines next to 69KV. Poor planning during planting resulted in unnecessary cost for tree work!!!
The Right Tree Needs to be Planted in the Right Place for the Right Reason in the Right Way

- Purpose for planting the tree, *the Right Reason*
- Tree location, *the Right Place.*
- Species growth and form, *the Right Tree.*
- Planting and After Care, *the Right Way*
Purpose for Planting,

**The Right Reason**

- Meet Requirement
- Erosion control/ Stormwater Reclamation
- Wind Break
- Visual Beauty
- Conserve Energy
Tree Location, *The Right Place*

- Spatial Constraints
- Utility Clearance
- Sunlight
- Soil conditions
**Figure 342-44** Sight triangle at intersections.

**TABLE 342-30**
Minimum Sight Distances (in feet) Necessary along Highway from Intersection

<table>
<thead>
<tr>
<th>Type of vehicle stopped</th>
<th>Major highway design speed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>30 mph</td>
</tr>
<tr>
<td>Passenger vehicle</td>
<td></td>
</tr>
<tr>
<td>Two-lane highway*</td>
<td>300</td>
</tr>
<tr>
<td>Four-lane highway</td>
<td>350</td>
</tr>
<tr>
<td>Single-unit vehicle</td>
<td></td>
</tr>
<tr>
<td>Two-lane highway</td>
<td>400</td>
</tr>
<tr>
<td>Four-lane highway</td>
<td>475</td>
</tr>
<tr>
<td>50-ft design vehicle</td>
<td></td>
</tr>
<tr>
<td>Two-lane highway</td>
<td>525</td>
</tr>
<tr>
<td>Four-lane highway</td>
<td>600</td>
</tr>
</tbody>
</table>

* 12-ft lanes with level conditions.
Utility Lines

Planting Zones

**STOP**
- No Tree Zone!
  - No trees, evergreen or shrubs within 25' of power lines

**CAUTION**
- Small Tree Zone
  - Plant trees less than 25' in height/spread at least 25' from overhead power lines
- Medium Tree Zone
  - Plant trees 25'-40' in height/spread at least 40' from overhead power lines

**CAUTION**
- Large Tree Zone
  - Plant trees larger than 40' in height/spread at least 60' from overhead power lines

**GO**
- Plant trees 25'-40' in height/spread at least 40' from overhead power lines

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Image of trees along a residential street with utility poles and power lines.
Spatial Constraints

- Adjacent Buildings
- Proximity to Curb-line and Sidewalk
- Intersections – provide sufficient sight distance
- Street signs
- Driveways
• Most overlooked factor
• Most trees grow best in moist, deep fertile, well drained soils
• Not usually found in developed areas
• Soil testing to determine pH and fertility. Soil pH range 5.5 -6.5. Pore space composed of 50% air, 50% water
1. Tree roots are not an underground reflection of the crown.

**NOT TRUE:** This artist’s concept regrettably shows how many people envision a tree’s root system. Most species do not even have a tap root, and only under rare circumstances would roots appear like this.

**MORE LIKELY:** Roots spread where soil conditions allow access to soil nutrients, moisture and sufficient air. This results in about 85 percent of a tree’s roots being in the top 18 inches of soil.
2. Roots spread far and wide!

Roots spread amazingly far from the trunk. They typically spread up to 2 times the height of the tree — and sometimes farther! However, the essential mass of roots is usually found within the “dripline,” the area underneath the tree’s branches.
Incorrect Planting

Not enough soil volume and rooting space to support tree size
Correct Planting

For a tree to survive a minimum of 2 cubic feet of soil volume for every square foot of crown projection.
How Tunneling Saves Trees

Trenching near a tree can kill as much as 40% - 50% of its roots, almost certainly leading to poor health, windthrow or outright death of the tree.
EXAMPLE:

5% Loss

25% Loss
Adjust the Route to Avoid Roots

In open areas like lawns or parks, get permission to curve the ditch route as far from the tree as possible, and no closer than the dripline.

Look for alternatives to standard routes to avoid cutting roots.
Species Growth and Form, The Right Tree

- Hardiness
- Tree Shape and Form
- Tree Size at Maturity
- Life Span
- Species Diversity

Diagram showing different tree shapes and species:
- V-Shaped: Hackberry
- Columnar: Lombardy Poplar
- Pyramidal: Pin Oak
- Round: White Oak
- Oval: Sugar Maple
# Tree Suggestions

<table>
<thead>
<tr>
<th>LOW GROW SPECIES</th>
<th>SALT TOLERANT LOW GROW SPECIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Paper bark Maple</td>
<td>• Apple Serviceberry</td>
</tr>
<tr>
<td>• Serviceberry</td>
<td>• Saucer Magnolia</td>
</tr>
<tr>
<td>• Redbud</td>
<td>• Crabapples</td>
</tr>
<tr>
<td>• Dogwoods</td>
<td>• Japanese Tree Lilac</td>
</tr>
<tr>
<td>• Hawthorn</td>
<td>• Eastern Arborvitae</td>
</tr>
<tr>
<td>• Magnolias</td>
<td>• Speckled Alder</td>
</tr>
<tr>
<td></td>
<td>• Witchazel</td>
</tr>
<tr>
<td></td>
<td>• Viburnums</td>
</tr>
</tbody>
</table>

*=can grow to medium height, plant wisely…*
Undesirable Species Traits

- Insects and Disease
- Fruits and Seeds
- Maintenance
Trees to Avoid

Silver Maple
Lombardy Poplar
Scotch pine
Green Ash
White Ash
Weeping Willow
Siberian (Chinese Elm)
Silver Poplar
Australian Willow
Planting, *The Right Way*

- Give your Tree the best start possible.
  - Choose healthy stock
  - Plan and prepare your planting site
  - Have an “after care” program
*Roots should be firm to the touch, especially near the trunk.*

*Root ball should be adequate for the tree’s size.*

*Roots should be moist & fibrous.*

*Deciduous seedlings should have roots about equal to stem length.*

*Root ball should be firm to the touch, especially near the trunk.*

*Pot should not contain large, circling roots.*

*Pruned roots cut cleanly, none wider than a finger.*

*Soil & roots joined tightly.*
Preparing your site...

- Root Placement = CRITICAL to tree health
- Hole size - Dig a shallow, broad planting hole
- 90% of tree root system is in the top 2-24” of soil.
Planting

- Use two opposing, flexible ties—when staking is necessary

- Keep mulch 1 to 2 inches back from trunk

- Trunk flare

- Gently pack backfill, using water to settle soil around the root ball

- Set ball on firmly packed soil to prevent settling

- Cut burlap and rope away from top third of root ball

- 2- to 4-inch layer of mulch
Six things you should know when planting a tree.

1. **Call Before You Dig** – Several days before planting, call the national 811 hotline to have underground utilities located.

2. **Handle with Care** – Always lift tree by the root ball. Keep roots moist until planting.

3. **Digging a Proper Hole** – Dig 2 to 5 times wider than the diameter of the root ball with sloping sides to allow for proper root growth.

4. **Planting Depth** – The trunk flare should sit slightly above ground level and the topmost roots should be buried 1 to 2 inches.

5. **Filling the Hole** – Backfill with native soil unless it’s all clay. Tamp in soil gently to fill large air spaces.

6. **Mulch** – Allow 1 to 2 inch clearance between the trunk and the mulch. Mulch should be 2 to 3 inches deep.

For more tree-planting tips and information, visit arborday.org.

Source: Arbor Day Foundation®

90075201
Watering

- Make sure every newly planted tree is watered.
- Trees take 1 year per inch of caliper to establish. Water is CRITICAL during this time.
- Water slowly and deeply.
- Keep soil moist, not saturated

<table>
<thead>
<tr>
<th>Size of tree</th>
<th>Quantity of water per week for the first 2 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 inch</td>
<td>10 gal.</td>
</tr>
<tr>
<td>2 inch</td>
<td>15 gal.</td>
</tr>
<tr>
<td>3 inch</td>
<td>20 gal.</td>
</tr>
<tr>
<td>4 inch</td>
<td>25 gal.</td>
</tr>
<tr>
<td>5 inch</td>
<td>30 gal.</td>
</tr>
</tbody>
</table>
The Good, the Bad, and the Ugly: Utility Planting Case Studies
What makes a “good” planting?

- Planning
- Site Evaluation
- Communication
- “Right Tree, Right Place”
- Diversity

Middlebury Utility Arboretum
Good planting with space for future growth
Account for underground

NOTICE

We need room to safely work on this device.

Please keep all permanent structures, fences, and vegetation 8 feet away from the front and 3 feet away from the sides and back of this device.

Obstructions will only cause difficulties and delays when restoring electric service.

For more information
Call 1(800) 4-NIPSCO

AVISO

Necesitamos espacio para trabajar con seguridad.
What makes a “Bad” Planting

- Lack of planning
- Poor communication
- Short term thinking
- “Any tree is better than no tree!”
Planted under line and will grow to block stop lights
A different species of tree would not have grown into lines
Notice the R/R spray zone
Planted too close together and under lines
What makes an “UGLY” planting?

• NO planning
• NO communication
• May contribute to a hazardous environment (block traffic, leave litter on public area)

This is at a HOSPITAL!!!!
“The Bad”: This is a city planted project done to fulfill a “Tree City USA” requirement.
Planting space width and tree selection

Narrow tree lawn and overhead lines
Tree selection and facilities

Street lighting, sidewalks, business entrances and road clearance