

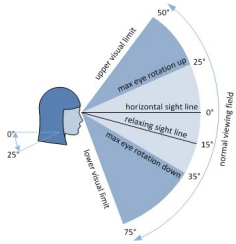


PRT Guideway Visual Intrusion Distance for the Average Human

Visual 1

PRT Guideway Visual Intrusion Distance for the Average Human

- Average human height = 5 ft 4 inches or 5.3 ft
- Average distance from top of head to eyes = 4 inches or 0.3 ft
 - Height of average human's eye level = $5.3 - 0.3 = 5 \text{ ft}$
 - Distance from the top of the PRT guideway to the person's eye level = **11 ft**
 - $(16 \text{ ft} - 5 \text{ ft} = 11 \text{ ft})$
- Height of PRT Guideway underpass = **16 ft**
- The approximate angle of a human's maximum eye rotation upward = **25 degrees**
- **X** = minimal distance from person to PRT guideway for the guideway to not obscure the person's view
- Find the full presentation of PRT visual intrusion at <https://milpitasprt.com/wp-content/uploads/visual-intrusion.pdf>



11 ft

5 ft

25 degrees

X = 23.59 ft

16 ft

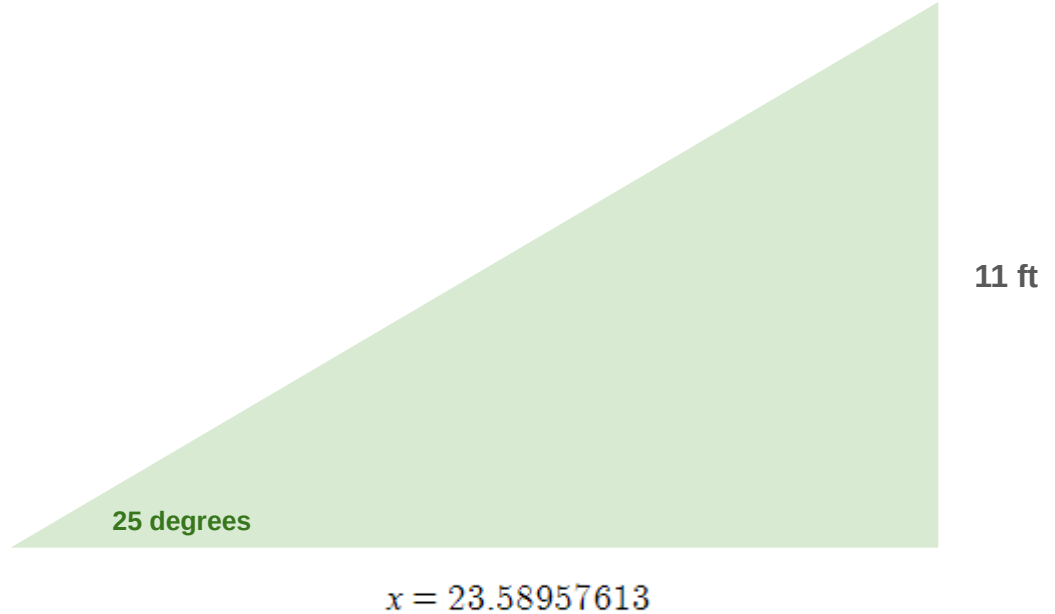


Calculating the PRT Guideway Visual Intrusion Distance for the Average Human

$$\tan(25) = \frac{11}{x}$$

$$x = \frac{11}{\tan(25)}$$

$$x = 23.58957613$$





LoopWorks

PRT Guideway Visual Intrusion Distance for the Average Human *(with a golf ball at an arm's length)*

Visual 2

PRT Guideway Visual Intrusion Distance for the Average Human (*with a golf ball at an arm's length*)

Vertical Intrusion Calculation for PRT Guideway

- Average human eye level height: 5 ft, (5.3 ft - 0.3 ft)
 - Average human height: 5.3 ft
 - Distance from top of head to eyes: 0.3 ft
- Vertical distance from person's eye level to top of guideway: 11 ft, (16 ft - 5 ft)
 - Height of PRT Guideway underpass = 16 ft
- Approximate maximum upward eye rotation angle= 25 degrees

Estimating Visual Obstruction Using a Golf Ball

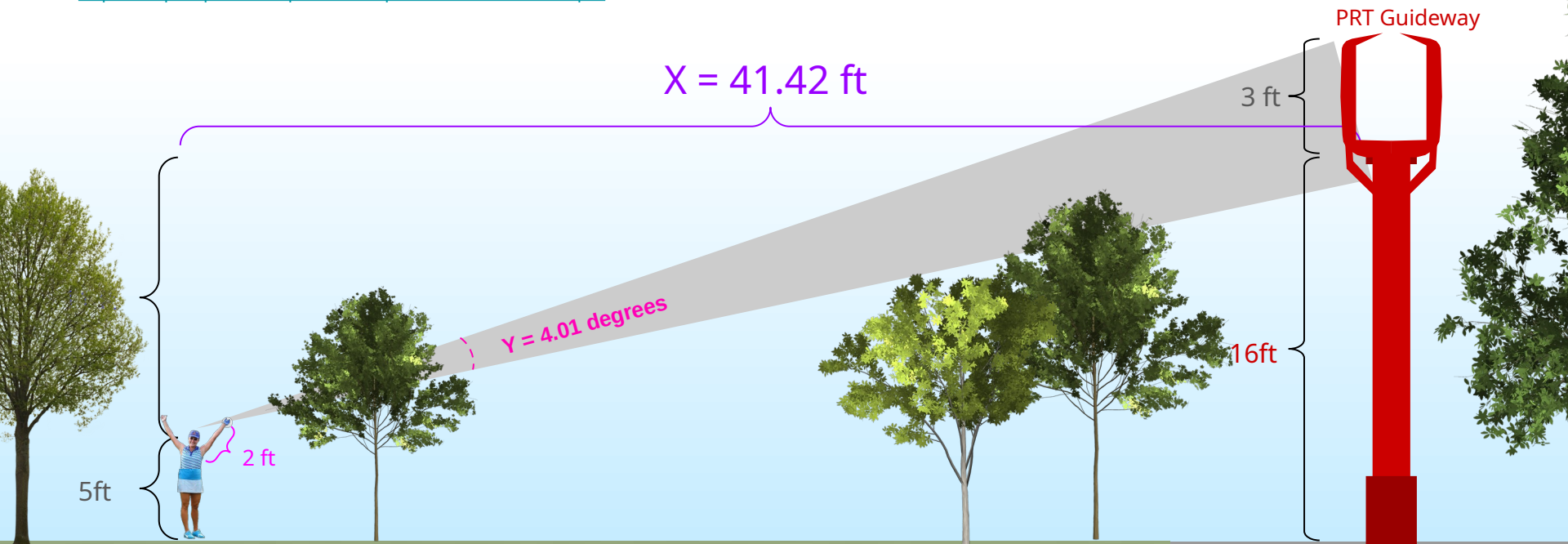
- X = Minimal distance from person to PRT guideway for a golf ball held at arm's length to completely obscure the height of the PRT guideway (3 ft)
- Average arm length: 2 ft
- Golf ball diameter = 1.68 inches (0.14ft)

Y: Angle of Visual Intrusion

- Y = Calculated upward visual angle if the person holds a golf ball at arm's length and it obscures the vertical height of the PRT guideway

Full details and visuals available here:

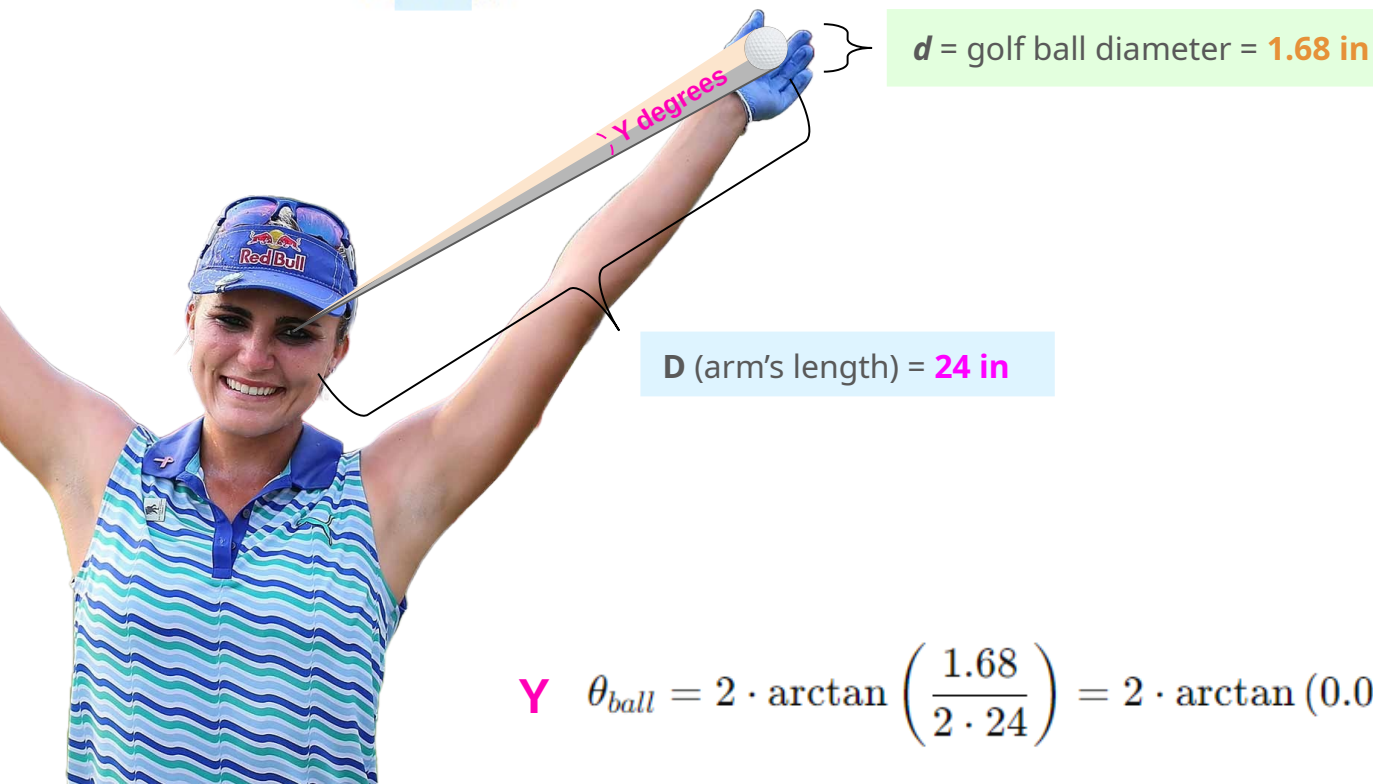
<https://milpitasprt.com/wp-content/uploads/visual-intrusion.pdf>



Calculating the PRT Guideway Visual Intrusion Distance for the Average Human (with a golf ball at an arm's length)

Step 1: Calculate the (γ) - the angle of visual intrusion when the golf ball is at an arm's length:

$$\gamma = 2 \cdot \arctan \left(\frac{d}{2D} \right)$$



$$\gamma \quad \theta_{ball} = 2 \cdot \arctan \left(\frac{1.68}{2 \cdot 24} \right) = 2 \cdot \arctan (0.035) \approx 2 \cdot 2.004^\circ = \boxed{4.01^\circ}$$

Calculating the PRT Guideway Visual Intrusion Distance for the Average Human (with a golf ball at an arm's length)

Step 2: Calculate the Direct Line of Sight distance

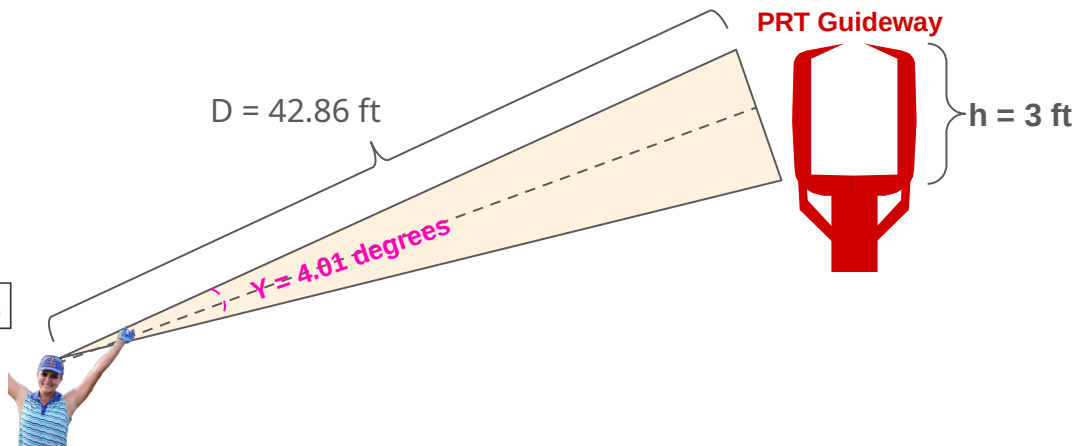
Theorem used: Angular size of golf ball = angular size of PRT Guideway

$$\theta = 2 \cdot \arctan\left(\frac{h}{2D}\right) \Rightarrow D = \frac{h}{2 \cdot \tan\left(\frac{\theta}{2}\right)}$$

h = height of object = 3 ft

$$\theta = 4.01^\circ$$

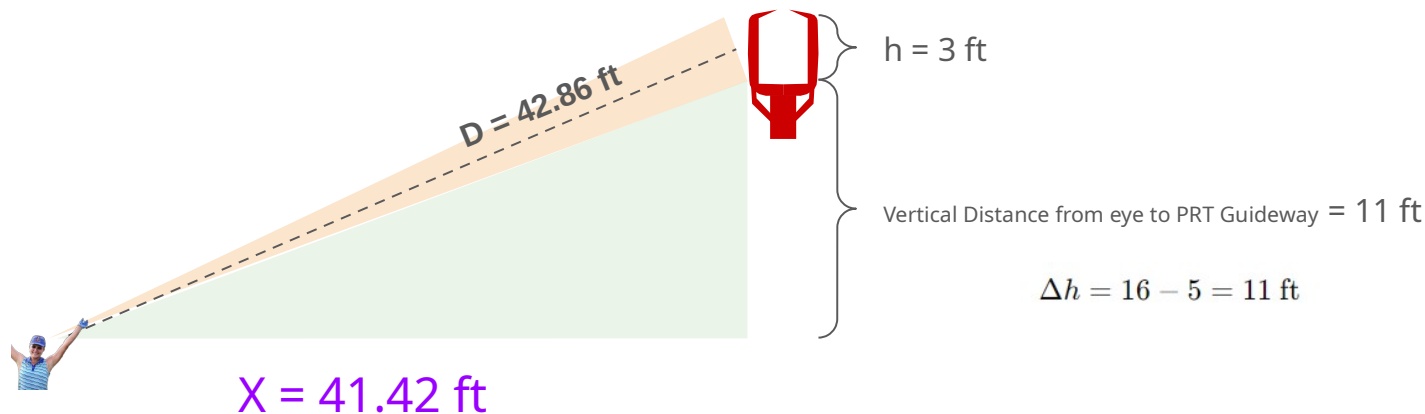
$$D = \frac{3}{2 \cdot \tan(2.005^\circ)} \approx \frac{3}{2 \cdot 0.035} \approx \frac{3}{0.070} = \boxed{42.86 \text{ ft}}$$



NOTE: D = Direct Line of Sight Distance

Calculating the PRT Guideway Visual Intrusion Distance for the Average Human (with a golf ball at an arm's length)

Step 3: Calculate X - the distance from the PRT Guideway



Pythagorean Theorem:

$$x = \sqrt{42.86^2 - 11^2} \approx \sqrt{1837.4 - 121} \approx \sqrt{1716.4} \approx \boxed{41.42 \text{ ft}}$$