



Vision RL

Wide Area Surveillance Systems

Lens Comparison for EO Base Unit and EO Spotter Camera

2013 Data, Pictures taken in Dayton, Ohio, USA

Background image taken from Spotter Camera using an 800mm lens, distant objects are $> 9\text{km}$ from camera. Middle of image is $> 4\text{km}$ from camera.

VISION-RL

128 Megapixels
190-Degree Field-of-View



VISION-R System Overlooking Dayton, OH

VISION-RL

Persistent Vision System

Base System Anatomy



Spotter Camera - *Option*

- Daylight (EO)
 - Available EO lens lengths from 200 mm to 1600 mm
 - 16 or 29 Megapixel
- NightTime (LWIR) - *Option*
 - Up to 3.1 megapixel
 - Up to 400 mm lens
 - Dedicated or co-bore sighted
- 300 degree operation
- Analyst cueing via iView Image Exploitation Software
- Constant on
- Step Stare when idle - *Option*

Vision RL Base System

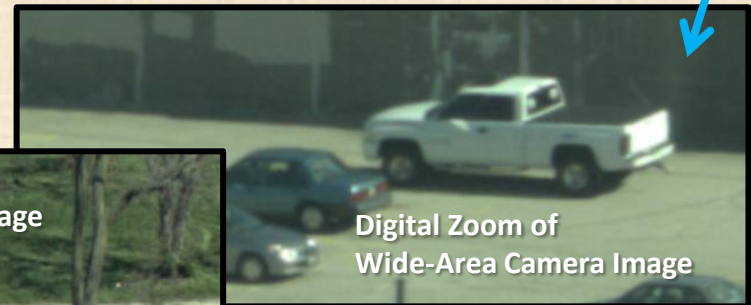
- Daylight (EO)
- Constant On
- Seven Cameras
- Available EO lens lengths from 50 mm to 200 mm
- 16 or 29 Megapixel
- Available 190 degree coverage
- 4 km radius, 25sq km coverage area
- ½ meter resolution throughout
- Image Processing Server
- iView Image Exploitation Software

Vision RL Multi-Mount

- Tripod
- Pole
- Building

Existing surveillance sensors are never “looking in the right spot” when something important happens...

A **Vision-RL** Series camera solves this problem. It doesn't need to be looking in the right spot to capture critical information because it has up to a 190 degree field-of-view and nearly 128,000,000 pixels to capture the information you need.



Perspective:

What a distance of 5.5km looks like



Preview

- The following images were taken on April 12, 2013 from a Vision RL camera mounted inside the Kettering Tower in Dayton, Ohio and on May 1, 2013 from the Ground Control Tower at Dayton International Airport (DAY).
- The Kettering Tower camera was placed on the 23rd floor of the building behind windows with an embedded ultraviolet filter.
 - The downtown camera was 100m above ground
 - The airport camera was 55m above ground
 - The weather in Dayton was heavily overcast with occasional rain
 - Photos were taken from 11:00 am to 1:00 pm EST

Downtown Dayton, Ohio

Camera mounted on 23rd floor of Kettering Tower

View looking East

Weather: heavily overcast

Capture date: April 12, 2013

Coverage Area

Vision RL Images

Viewer: iView

Image was refined in PSS iView viewer using

Bloom and Gloom optical effects

pss_2013_04_12

ALERT

SLIDE #1

SCENARIO

Vision RL with 135mm main cameras mounted at roughly 100 meter elevation.

This image is not zoomed. This particular Vision RL system consists of five 135mm lenses to give greater distance coverage.

NEXT SLIDES

The next seven slides will show zoomed in portions of this coverage area

Mouse 686.00/346.00

- Map Layer
- PSS Image
- Tracking
- Motion Detect
- Motion Alarm
- Layers
- Effects

Containment Dome: 9 km

Tower: 9.4 km

Crosswalk: 1.4 km

Inner orange box indicates location of zoomed in coverage. Outer box shows total coverage area.

Downtown Dayton, Ohio

Camera mounted on 23rd floor of Kettering Tower

View looking East

Weather: heavily overcast

Capture date: April 12, 2013

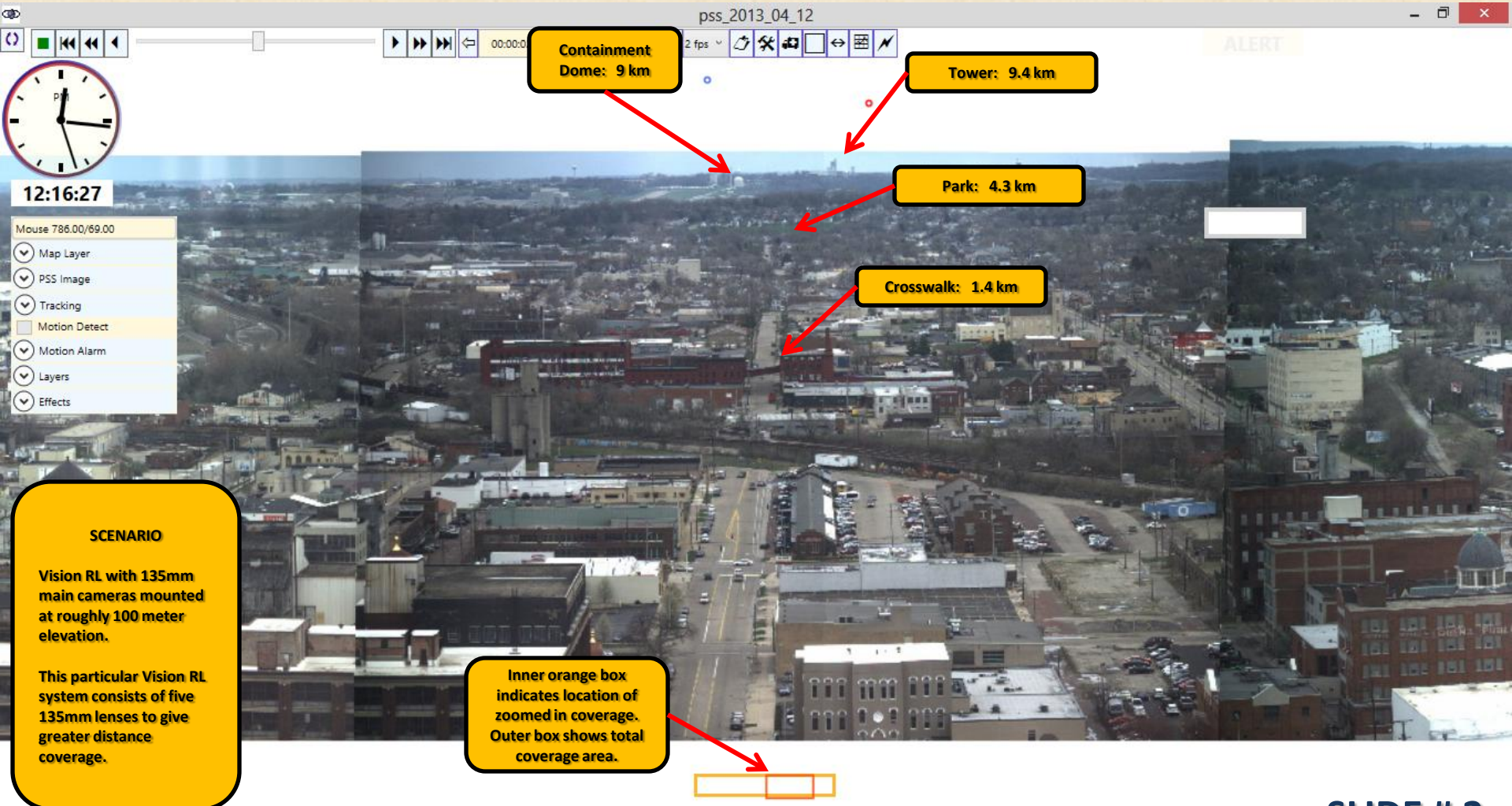
ZOOM Coverage Area

Vision RL Images

Viewer: iView

Image was refined in PSS iView viewer using

Bloom and Gloom optical effects



Downtown Dayton, Ohio

Camera mounted on 23rd floor of Kettering Tower

View looking East

Weather: heavily overcast

Capture date: April 12, 2013

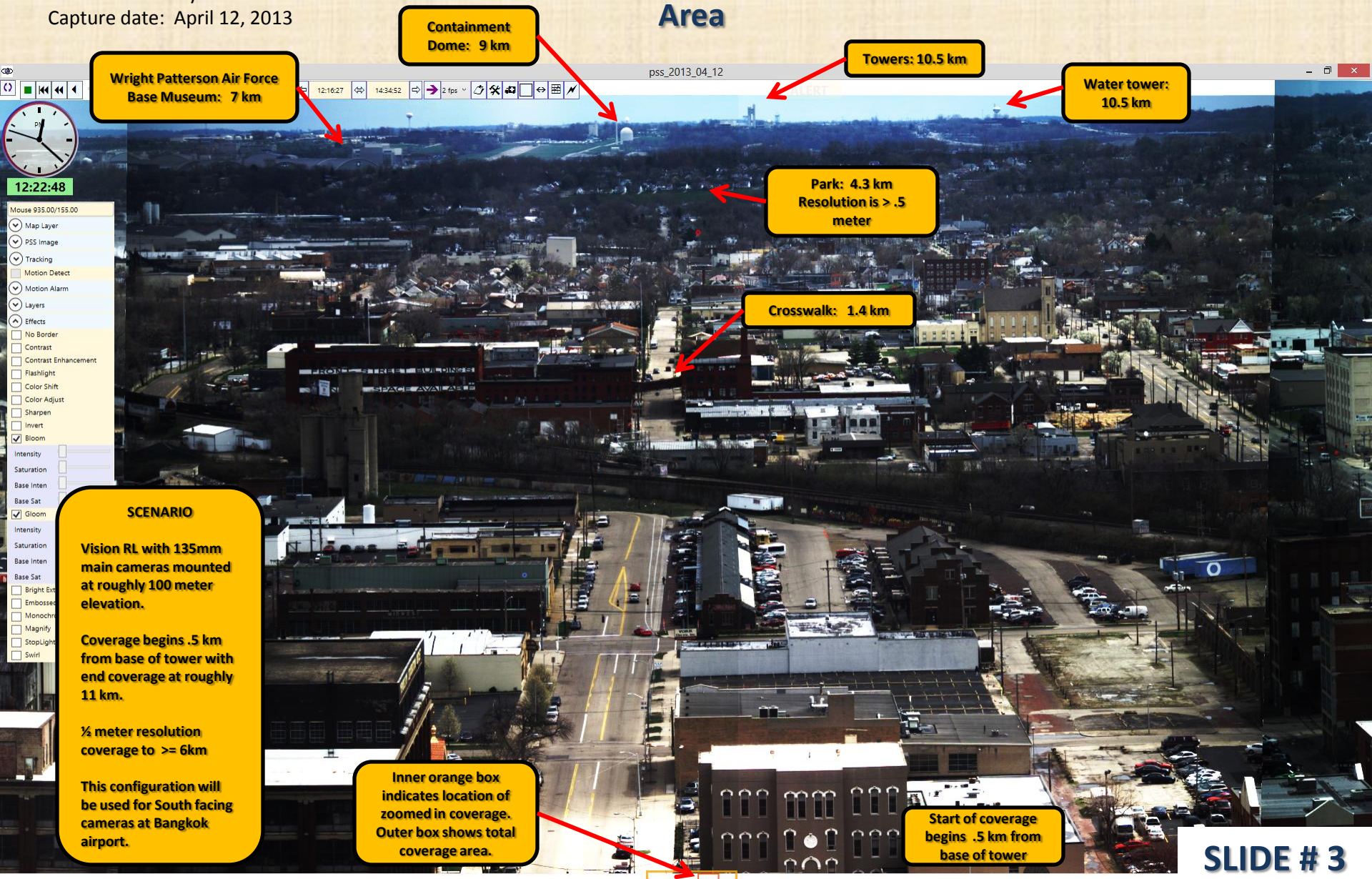
Vision RL Images

Viewer: iView

Image was refined in PSS iView viewer using

Bloom and Gloom optical effects

ZOOM
Coverage
Area



Downtown Dayton, Ohio

Camera mounted on 23rd floor of Kettering Tower

View looking East

Weather: heavily overcast

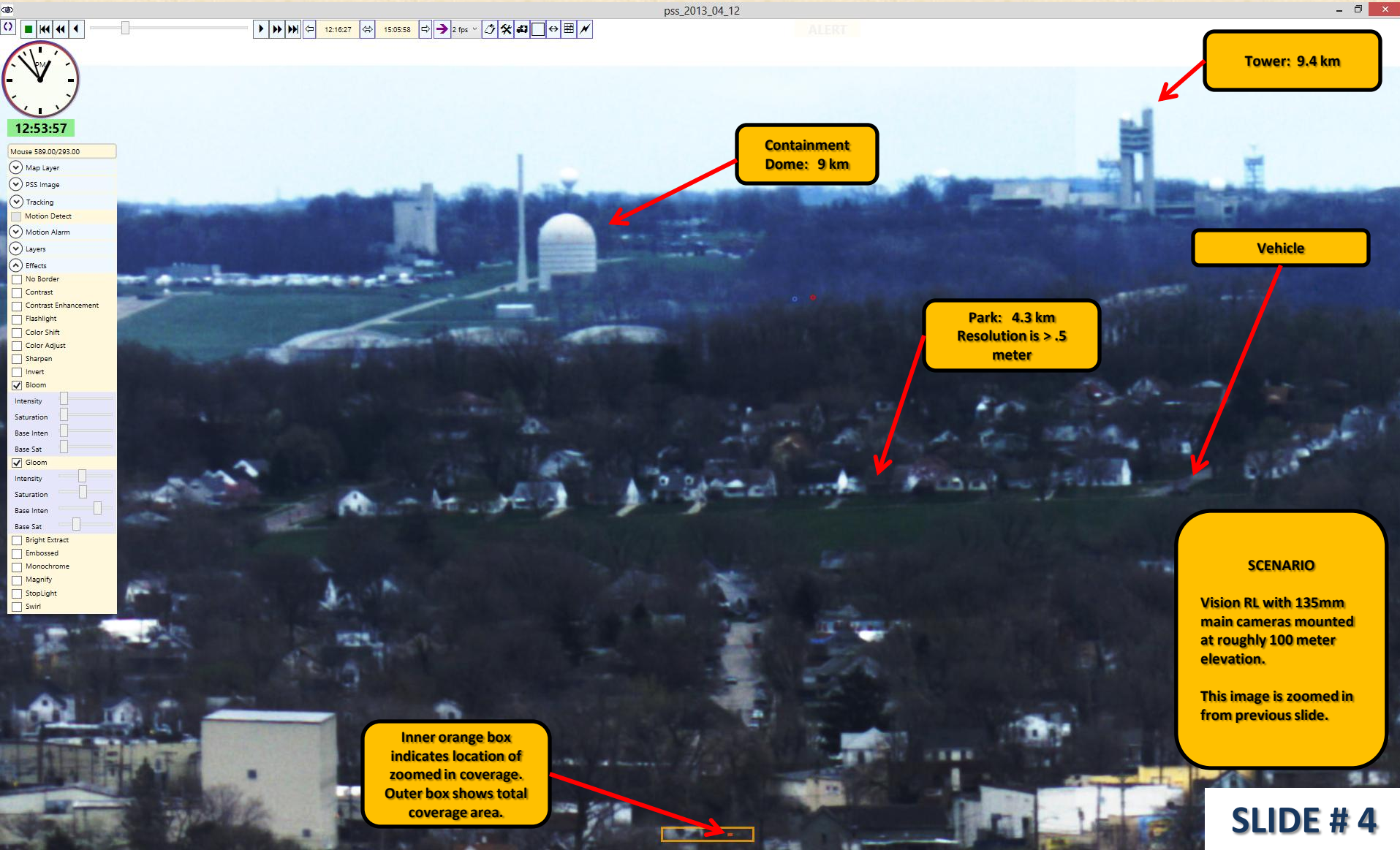
Capture date: April 12, 2013

ZOOM
Coverage
Area

Vision RL Images

Viewer: iView

Image was refined in PSS iView viewer using
Bloom and Gloom optical effects



Downtown Dayton, Ohio

Camera mounted on 23rd floor of Kettering Tower

View looking East

Weather: heavily overcast

Capture date: April 12, 2013

ZOOM Coverage Area

Vision RL Images

Viewer: iView

Image was refined in PSS iView viewer using
Bloom and Gloom optical effects

pss_2013_04_12

12:55:22

Mouse 1138.00/183.00

- Map Layer
- PSS Image
- Tracking
- Motion Detect
- Motion Alarm
- Layers
- Effects
 - No Border
 - Contrast
 - Contrast Enhancement
 - Flashlight
 - Color Shift
 - Color Adjust
 - Sharpen
 - Invert
 - ☒ Bloom
- Gloom
 - Intensity
 - Saturation
 - Base Inten
 - Base Sat

Vehicle

Containment Dome: 9 km

SCENARIO

Vision RL with 135mm main cameras mounted at roughly 100 meter elevation.

This image is zoomed in from previous slide.

Vehicle

Park: 4.3 km
Resolution is > .5 meter

Inner orange box indicates location of zoomed in coverage. Outer box shows total coverage area.

Downtown Dayton, Ohio

Camera mounted on 23rd floor of Kettering Tower

View looking East

Weather: heavily overcast

Capture date: April 11, 2013

ZOOM
Coverage
Area

Vision RL Images

Viewer: iView

Image was refined in PSS iView viewer using

Bloom and Gloom optical effects

pss_2013_04_12

00:00:02 23:59:59 2 fps

13:02:08

Mouse 1165.00/247.00

- ☒ Map Layer
- ☒ PSS Image
- ☒ Tracking
- ☐ Motion Detect
- ☒ Motion Alarm
- ☒ Layers
- ☒ Effects
 - ☐ No Border
 - ☐ Contrast
 - ☐ Contrast Enhancement
 - ☐ Flashlight
 - ☐ Color Shift
 - ☐ Color Adjust
 - ☐ Sharpen
 - ☐ Invert
 - ☒ Bloom
- ☐ Intensity
- ☐ Saturation
- ☐ Base Inten
- ☐ Base Sat
- ☐ Gloom
- ☐ Bright Extract
- ☐ Embossed
- ☐ Monochrome
- ☐ Magnify
- ☐ StopLight

Park: 4.3 km
Resolution is > .5
meter

Person

SCENARIO

Vision RL with 135mm
main cameras mounted
at roughly 100 meter
elevation.

This image is zoomed in
from previous slide.

Inner orange box
indicates location of
zoomed in coverage.
Outer box shows total
coverage area.

SLIDE # 6

Downtown Dayton, Ohio

Camera mounted on 23rd floor of Kettering Tower

View looking East

Weather: heavily overcast

Capture date: April 12, 2013

ZOOM Coverage Area

Vision RL Images

Viewer: iView

Image was refined in PSS iView viewer using

Bloom and Gloom optical effects

pss_2013_04_12

13:02:13

Mouse 1293.00/188.00

- Map Layer
- PSS Image
- Tracking
 - Motion Detect
 - Motion Alarm
- Layers
- Effects
 - No Border
 - Contrast
 - Contrast Enhancement
 - Flashlight
 - Color Shift
 - Color Adjust
 - Sharpen
 - Invert
 - ☒ Bloom
 - Intensity
 - Saturation
 - Base Inten
 - Base Sat
 - ☐ Gloom
 - Bright Extract
 - Embossed
 - Monochrome
 - Magnify
 - StopLight

Park: 4.3 km
Resolution is > .5
meter

Person –
Advanced in
frame

SCENARIO

Vision RL with 135mm
main cameras mounted
at roughly 100 meter
elevation.

This image is zoomed in
from previous slide.

Inner orange box
indicates location of
zoomed in coverage.
Outer box shows total
coverage area.

PSS

Spotter Camera Comparison

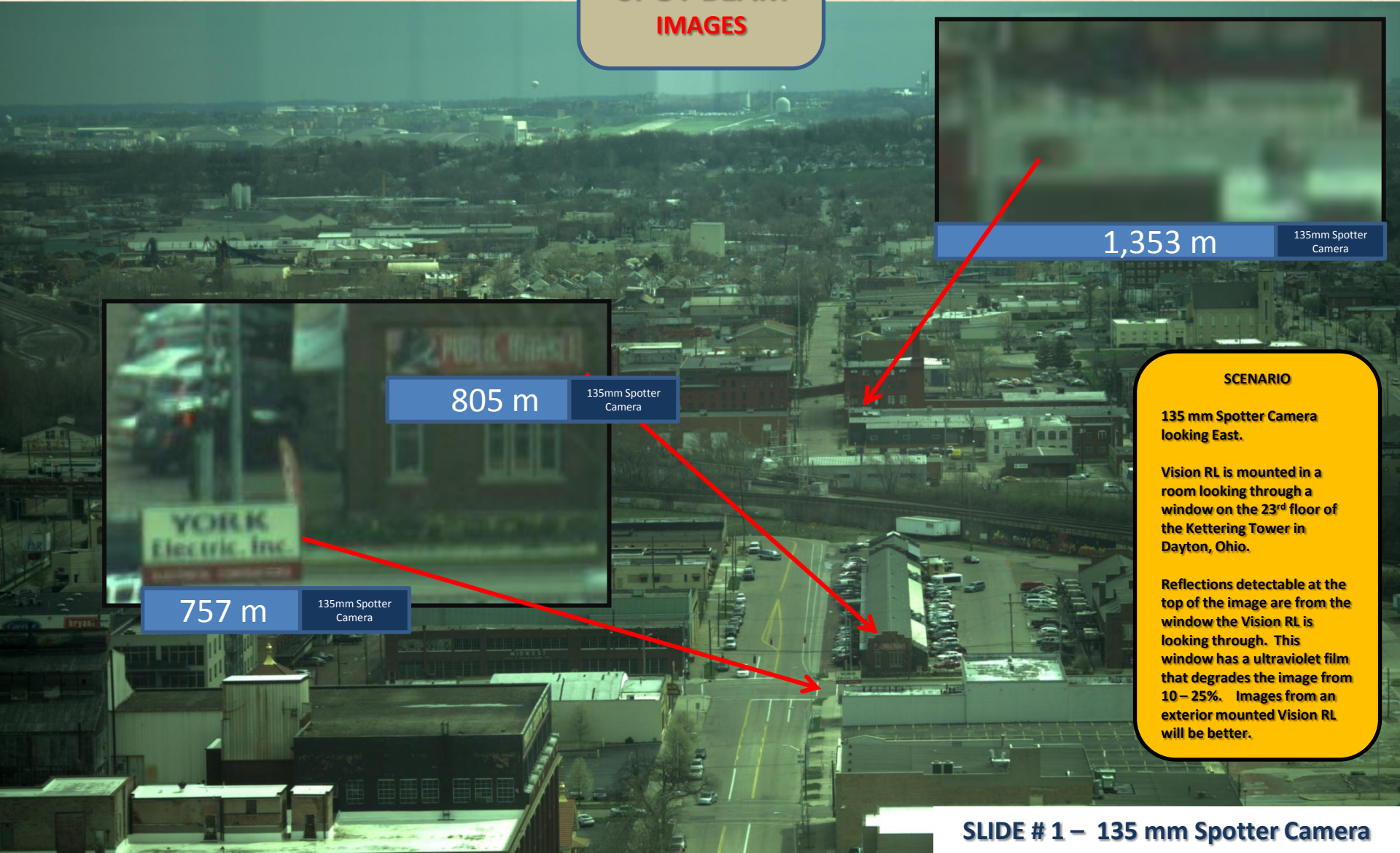
135mm Spotter Camera

Downtown Dayton, Ohio

Camera mounted on 23rd floor of Kettering Tower
View looking East
Weather: heavily overcast
Capture date: April 12, 2013

Vision RL Images
Viewer: iView
Image was refined in PSS iView viewer using
Bloom and Gloom optical effects

135 mm
SPOT BEAM
IMAGES



1,353 m

135mm Spotter
Camera

805 m

135mm Spotter
Camera

757 m

135mm Spotter
Camera

SCENARIO

135 mm Spotter Camera
looking East.

Vision RL is mounted in a
room looking through a
window on the 23rd floor of
the Kettering Tower in
Dayton, Ohio.

Reflections detectable at the
top of the image are from the
window the Vision RL is
looking through. This
window has a ultraviolet film
that degrades the image from
10 – 25%. Images from an
exterior mounted Vision RL
will be better.

Downtown Dayton, Ohio

Camera mounted on 23rd floor of Kettering Tower
View looking East
Weather: heavily overcast
Capture date: April 12, 2013

Vision RL Images

Viewer: iView

Image was refined in PSS iView viewer using
Bloom and Gloom optical effects

**135 mm
SPOT BEAM
IMAGES**

Distance to center of
image from spotter
camera: 512 m

SCENARIO

135 mm Spotter Camera
looking East.

Vision RL is mounted in a
room looking through a
window on the 23rd floor of
the Kettering Tower in
Dayton, Ohio.

Reflections detectable at the
top of the image are from the
window the Vision RL is
looking through. This
window has a ultraviolet film
that degrades the image from
10 – 25%. Images from an
exterior mounted Vision RL
will be better.

Downtown Dayton, Ohio
Camera mounted on 23rd floor of Kettering Tower
View looking East
Weather: heavily overcast
Capture date: April 12, 2013

Vision RL Images
Viewer: iView
Image was refined in PSS iView viewer using
Bloom and Gloom optical effects

**135 mm
SPOT BEAM
IMAGES**

Distance to center of
image from spotter
camera 290m



290 m 135mm Spotter Camera

SCENARIO

135 mm Spotter Camera looking East.

Vision RL is mounted in a room looking through a window on the 23rd floor of the Kettering Tower in Dayton, Ohio.

Reflections detectable at the top of the image are from the window the Vision RL is looking through. This window has a ultraviolet film that degrades the image from 10 – 25%. Images from an exterior mounted Vision RL will be better.

Street Sign Letters are 15cm tall



231 m 135mm Spotter Camera

Downtown Dayton, Ohio
Camera mounted on 23rd floor of Kettering Tower
View looking East
Weather: heavily overcast
Capture date: April 12, 2013

135 mm
SPOT BEAM
IMAGES

Vision RL Images
Viewer: iView
Image was refined in PSS iView viewer using
Bloom and Gloom optical effects

Distance to center of
image from spotter
camera: 185m



185 m 135mm Spotter Camera

SCENARIO

135 mm Spotter Camera looking East.

Vision RL is mounted in a room looking through a window on the 23rd floor of the Kettering Tower in Dayton, Ohio.

Reflections detectable at the top of the image are from the window the Vision RL is looking through. This window has a ultraviolet film that degrades the image from 10 – 25%. Images from an exterior mounted Vision RL will be better.

400 mm Spotter Camera

Downtown Dayton, Ohio

Camera mounted on 23rd floor of Kettering Tower
View looking East
Weather: heavily overcast
Capture date: April 12, 2013

**400 mm
SPOT BEAM
IMAGES**

Vision RL Images

Viewer: iView

Image was refined in PSS iView viewer using
Bloom and Gloom optical effects

NO ZOOM

SCENARIO

400 mm Spotter Camera
looking East.

Vision RL is mounted in a
room looking through a
window on the 23rd floor of
the Kettering Tower in
Dayton, Ohio.

Reflections detectable at the
top of the image are from the
window the Vision RL is
looking through. This
window has a ultraviolet film
that degrades the image from
10 – 25%. Images from an
exterior mounted Vision RL
will be better.

SLIDE # 1 – 400 mm Spotter Camera

Downtown Dayton, Ohio

Camera mounted on 23rd floor of Kettering Tower
View looking East
Weather: heavily overcast
Capture date: April 12, 2013

Vision RL Images

Viewer: iView
Image was refined in PSS iView viewer using
Bloom and Gloom optical effects



4,258 m

400mm Spotter
Camera

**400 mm
SPOT BEAM
IMAGES**



1,353 m

400mm Spotter
Camera

SCENARIO

135 mm Spotter Camera
looking East.

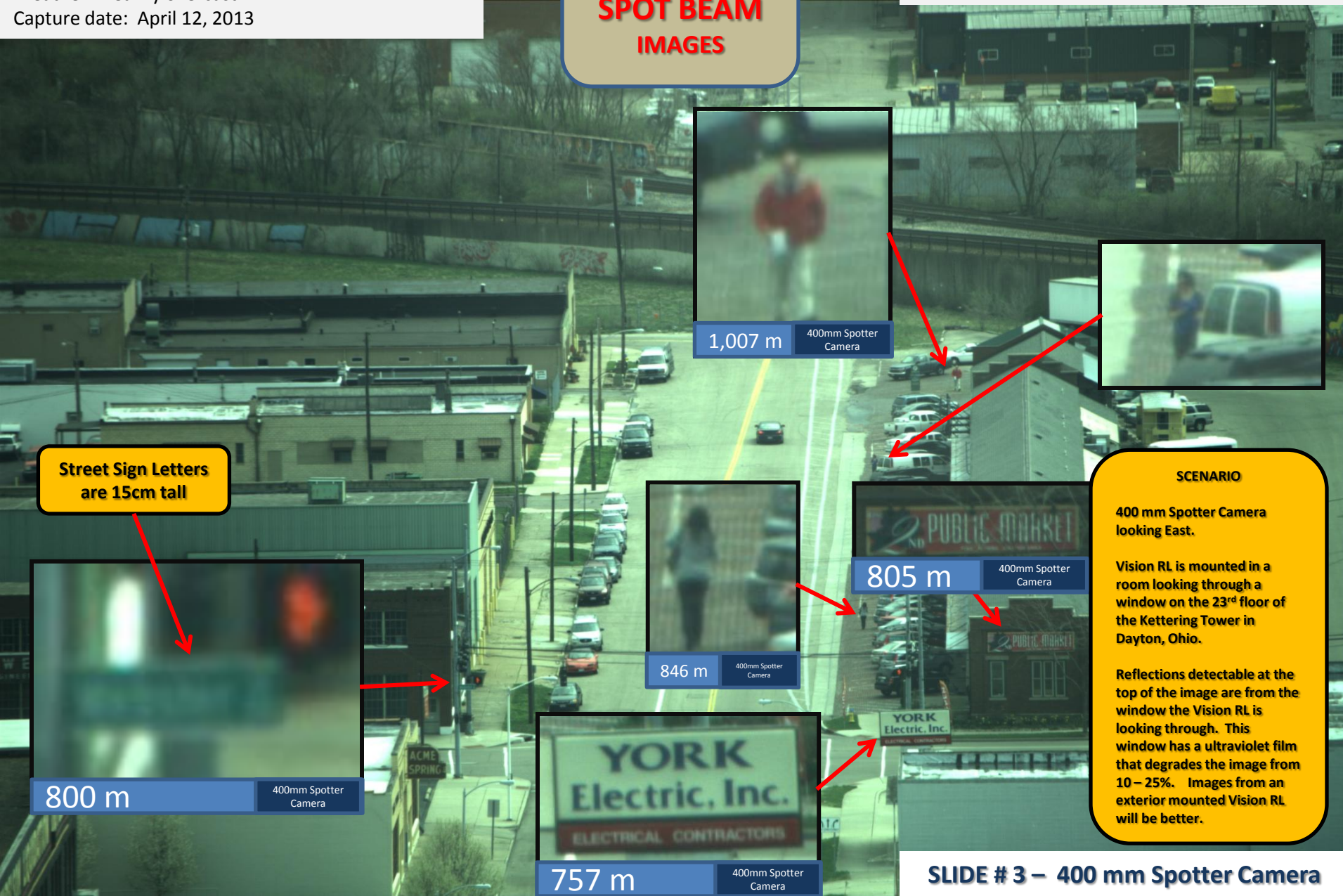
Vision RL is mounted in a
room looking through a
window on the 23rd floor of
the Kettering Tower in
Dayton, Ohio.

Reflections detectable at the
top of the image are from the
window the Vision RL is
looking through. This
window has a ultraviolet film
that degrades the image from
10 – 25%. Images from an
exterior mounted Vision RL
will be better.

Downtown Dayton, Ohio
Camera mounted on 23rd floor of Kettering Tower
View looking East
Weather: heavily overcast
Capture date: April 12, 2013

Vision RL Images
Viewer: iView
Image was refined in PSS iView viewer using
Bloom and Gloom optical effects

400 mm
SPOT BEAM
IMAGES



Street Sign Letters
are 15cm tall



800 m

400mm Spotter
Camera



1,007 m

400mm Spotter
Camera



846 m

400mm Spotter
Camera



805 m

400mm Spotter
Camera



757 m

400mm Spotter
Camera

SCENARIO

400 mm Spotter Camera
looking East.

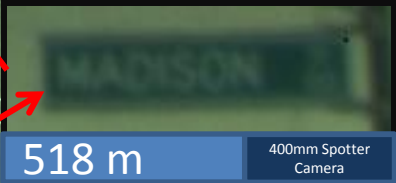
Vision RL is mounted in a
room looking through a
window on the 23rd floor of
the Kettering Tower in
Dayton, Ohio.

Reflections detectable at the
top of the image are from the
window the Vision RL is
looking through. This
window has a ultraviolet film
that degrades the image from
10 – 25%. Images from an
exterior mounted Vision RL
will be better.

Downtown Dayton, Ohio
Camera mounted on 23rd floor of Kettering Tower
View looking East
Weather: heavily overcast
Capture date: April 12, 2013

Vision RL Images
Viewer: iView
Image was refined in PSS iView viewer using
Bloom and Gloom optical effects

400 mm
SPOT BEAM
IMAGES



Street Sign Letters
are 15cm tall

Center of image is 490 m
from Spotter Camera



SCENARIO

400 mm Spotter Camera
looking East.

Vision RL is mounted in a
room looking through a
window on the 23rd floor of
the Kettering Tower in
Dayton, Ohio.

Reflections detectable at the
top of the image are from the
window the Vision RL is
looking through. This
window has a ultraviolet film
that degrades the image from
10 – 25%. Images from an
exterior mounted Vision RL
will be better.

Downtown Dayton, Ohio
Camera mounted on 23rd floor of Kettering Tower
View looking East
Weather: heavily overcast
Capture date: April 12, 2013

Vision RL Images
Viewer: iView
Image was refined in PSS iView viewer using
Bloom and Gloom optical effects

**400 mm
SPOT BEAM
IMAGES**

Center of image is 359 m
from Spotter Camera



Street Sign Letters
are 15cm tall



SCENARIO

400 mm Spotter Camera
looking East.

Vision RL is mounted in a
room looking through a
window on the 23rd floor of
the Kettering Tower in
Dayton, Ohio.

Reflections detectable at the
top of the image are from the
window the Vision RL is
looking through. This
window has a ultraviolet film
that degrades the image from
10 – 25%. Images from an
exterior mounted Vision RL
will be better.

Downtown Dayton, Ohio
Camera mounted on 23rd floor of Kettering Tower
View looking East
Weather: heavily overcast
Capture date: April 12, 2013

Vision RL Images
Viewer: iView
Image was refined in PSS iView viewer using
Bloom and Gloom optical effects

400 mm
SPOT BEAM
IMAGES



290 m

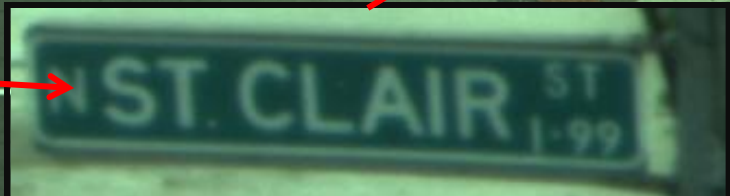
400mm Spotter
Camera



249 m

400mm Spotter
Camera

Street Sign Letters
are 15cm tall



231 m

400mm Spotter
Camera

SCENARIO

400 mm Spotter Camera
looking East.

Vision RL is mounted in a
room looking through a
window on the 23rd floor of
the Kettering Tower in
Dayton, Ohio.

Reflections detectable at the
top of the image are from the
window the Vision RL is
looking through. This
window has a ultraviolet film
that degrades the image from
10 – 25%. Images from an
exterior mounted Vision RL
will be better.

Downtown Dayton, Ohio
Camera mounted on 23rd floor of Kettering Tower
View looking East
Weather: heavily overcast
Capture date: April 12, 2013

400 mm
SPOT BEAM
IMAGES

Vision RL Images
Viewer: iView
Image was refined in PSS iView viewer using
Bloom and Gloom optical effects

Center of image is 190 m
from Spotter Camera



SCENARIO

400 mm Spotter Camera looking East.

Vision RL is mounted in a room looking through a window on the 23rd floor of the Kettering Tower in Dayton, Ohio.

Reflections detectable at the top of the image are from the window the Vision RL is looking through. This window has a ultraviolet film that degrades the image from 10 – 25%. Images from an exterior mounted Vision RL will be better.i



Numbers & Letters
are 6.35cm tall and
3cm wide

800 mm Spotter Camera

Downtown Dayton, Ohio

Camera mounted on 23rd floor of Kettering Tower
View looking East
Weather: mostly sunny
Capture date: May 1, 2013

**800 mm
SPOT BEAM
IMAGES**

NO ZOOM

Vision RL Images

Viewer: iView

Image was refined in PSS iView viewer using
Bloom and Gloom optical effects

SCENARIO

800 mm Spotter Camera
looking East.

Vision RL is mounted in a
room looking through a
window on the 23rd floor of
the Kettering Tower in
Dayton, Ohio.

Reflections detectable at the
top of the image are from the
window the Vision RL is
looking through. This
window has a ultraviolet film
that degrades the image from
10 – 25%. Images from an
exterior mounted Vision RL
would be improved.

SLIDE # 1 – 800 mm Spotter Camera

Downtown Dayton, Ohio

Camera mounted on 23rd floor of Kettering Tower
View looking East
Weather: mostly sunny
Capture date: May 1, 2013

**800 mm
SPOT BEAM**

Vision RL Images
Viewer: iView
Image was refined in PSS iView viewer using
Bloom and Gloom optical effects



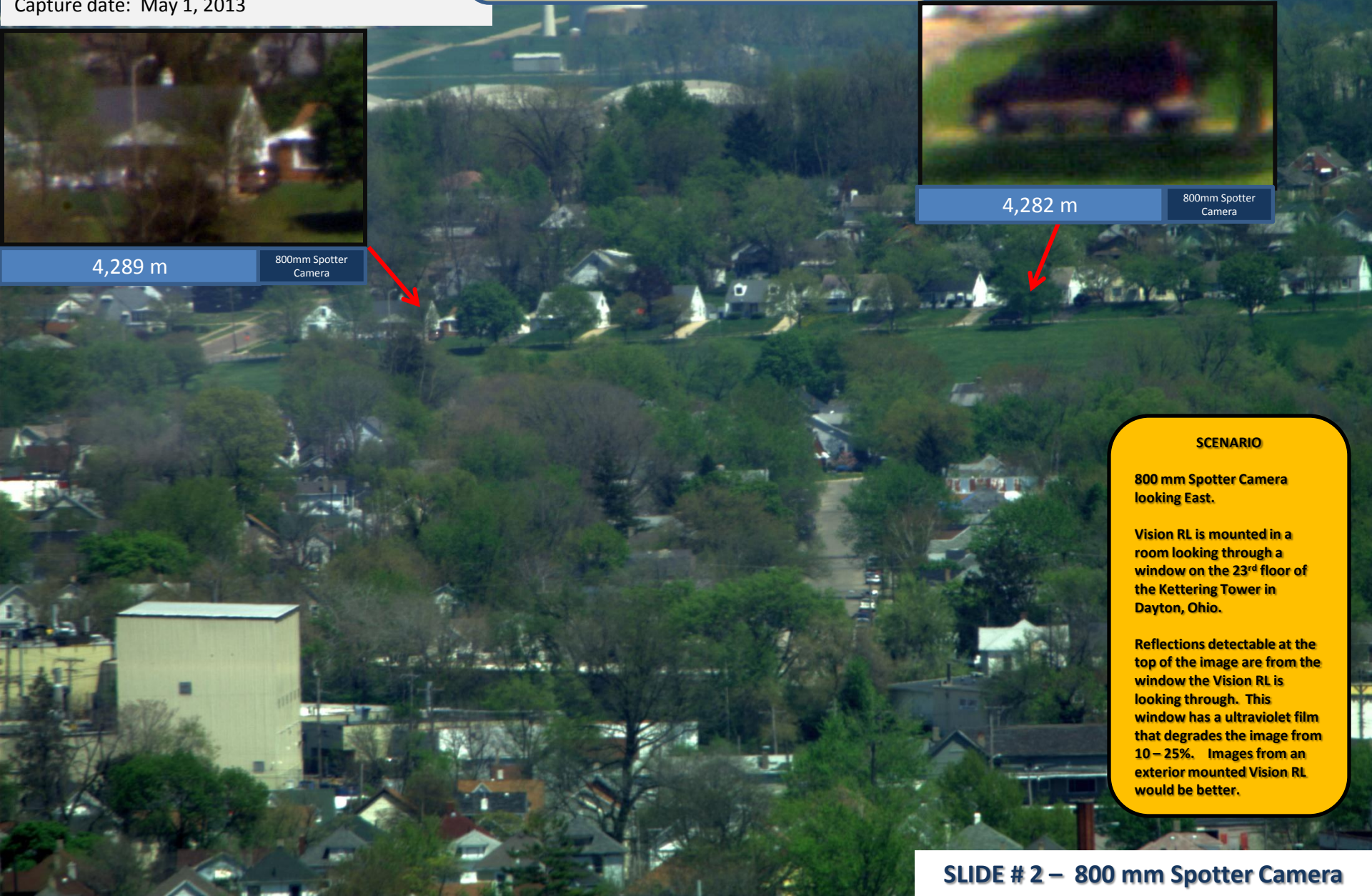
4,289 m

800mm Spotter
Camera



4,282 m

800mm Spotter
Camera



SCENARIO

800 mm Spotter Camera
looking East.

Vision RL is mounted in a
room looking through a
window on the 23rd floor of
the Kettering Tower in
Dayton, Ohio.

Reflections detectable at the
top of the image are from the
window the Vision RL is
looking through. This
window has a ultraviolet film
that degrades the image from
10 – 25%. Images from an
exterior mounted Vision RL
would be better.

Downtown Dayton, Ohio
Camera mounted on 23rd floor of Kettering Tower
View looking East
Weather: mostly sunny
Capture date: May 1, 2013

**800 mm
SPOT BEAM**

Vision RL Images
Viewer: iView
Image was refined in PSS iView viewer using
Bloom and Gloom optical effects



SCENARIO

800 mm Spotter Camera looking East.

Vision RL is mounted in a room looking through a window on the 23rd floor of the Kettering Tower in Dayton, Ohio.

Reflections detectable at the top of the image are from the window the Vision RL is looking through. This window has a ultraviolet film that degrades the image from 10 – 25%. Images from an exterior mounted Vision RL would be better.

Downtown Dayton, Ohio

Camera mounted on 23rd floor of Kettering Tower
View looking East
Weather: mostly sunny
Capture date: May 1, 2013

800 mm
SPOT BEAM
IMAGES

Vision RL Images

Viewer: iView
Image was refined in PSS iView viewer using
Bloom and Gloom optical effects



850 m

800mm Spotter
Camera

SCENARIO

800 mm Spotter Camera
looking East.

Vision RL is mounted in a
room looking through a
window on the 23rd floor of
the Kettering Tower in
Dayton, Ohio.

Reflections detectable at the
top of the image are from
the window the Vision RL is
looking through. This
window has a ultraviolet film
that degrades the image from
10 – 25%. Images from an
exterior mounted Vision RL
will be better.



782 m

800mm Spotter
Camera

Downtown Dayton, Ohio

Camera mounted on 23rd floor of Kettering Tower
View looking East
Weather: mostly sunny
Capture date: May 1, 2013

800 mm
SPOT BEAM
IMAGES

Vision RL Images

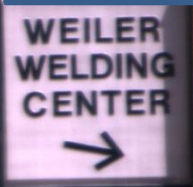
Viewer: iView

Image was refined in PSS iView viewer using
Bloom and Gloom optical effects



470 m

800mm Spotter
Camera



450 m

800mm Spotter
Camera

SCENARIO

800 mm Spotter Camera looking East.

Vision RL is mounted in a room looking through a window on the 23rd floor of the Kettering Tower in Dayton, Ohio.

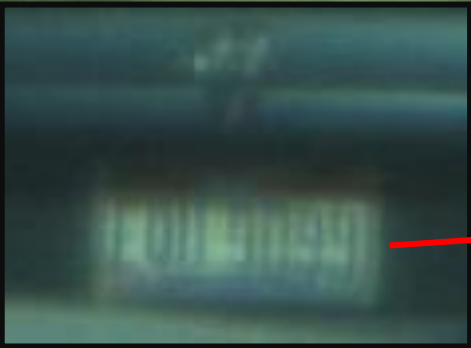
Reflections detectable at the top of the image are from the window the Vision RL is looking through. This window has an ultraviolet film that degrades the image from 10 – 25%. Images from an exterior mounted Vision RL will be better.

Downtown Dayton, Ohio

Camera mounted on 23rd floor of Kettering Tower
View looking East
Weather: heavily overcast
Capture date: April 12, 2013

**800 mm
SPOT BEAM
IMAGES**

Vision RL Images
Viewer: iView
Image was refined in PSS iView viewer using
Bloom and Gloom optical effects



412m

Numbers & Letters
are 6.35cm tall and
3cm wide



SCENARIO

800 mm Spotter Camera looking East.

Vision RL is mounted in a room looking through a window on the 23rd floor of the Kettering Tower in Dayton, Ohio.

Reflections detectable at the top of the image are from the window the Vision RL is looking through. This window has a ultraviolet film that degrades the image from 10 – 25%. Images from an exterior mounted Vision RL will be better.

Downtown Dayton, Ohio
Camera mounted on 23rd floor of Kettering Tower
View looking East
Weather: heavily overcast
Capture date: April 12, 2013

800 mm
SPOT BEAM
IMAGES

Vision RL Images
Viewer: iView
Image was refined in PSS iView viewer using
Bloom and Gloom optical effects



510m

SCENARIO

800 mm Spotter Camera looking East.

Vision RL is mounted in a room looking through a window on the 23rd floor of the Kettering Tower in Dayton, Ohio.

Reflections detectable at the top of the image are from the window the Vision RL is looking through. This window has a ultraviolet film that degrades the image from 10 – 25%. Images from an exterior mounted Vision RL will be better.

Downtown Dayton, Ohio

Camera mounted on 23rd floor of Kettering Tower
View looking East
Weather: heavily overcast
Capture date: April 12, 2013

Vision RL Images

Viewer: iView

Image was refined in PSS iView viewer using
Bloom and Gloom optical effects

**800 mm
SPOT BEAM
IMAGES**

1051m

SCENARIO

800 mm Spotter Camera
looking East.

Vision RL is mounted in a
room looking through a
window on the 23rd floor of
the Kettering Tower in
Dayton, Ohio.

Reflections detectable at the
top of the image are from the
window the Vision RL is
looking through. This
window has a ultraviolet film
that degrades the image from
10 – 25%. Images from an
exterior mounted Vision RL
will be better.

SLIDE # 6 – 800 mm Spotter Camera

1600 mm Spotter Camera

Dayton International Airport (DAY)

Dayton, Ohio

Camera mounted on Ground Control Tower ~ 40m

Weather: Partly Cloudy & Windy

Capture date: May 1, 2013

SCENARIO

1600 mm Spotter Camera.

Vision RL is mounted on the Dayton international Airport Ground Control Tower.

Clarity is affected by weather conditions such as heat, humidity, and wind.

**1600 mm
SPOT BEAM
IMAGES**

NO DIGITAL ZOOM

Vision RL Images

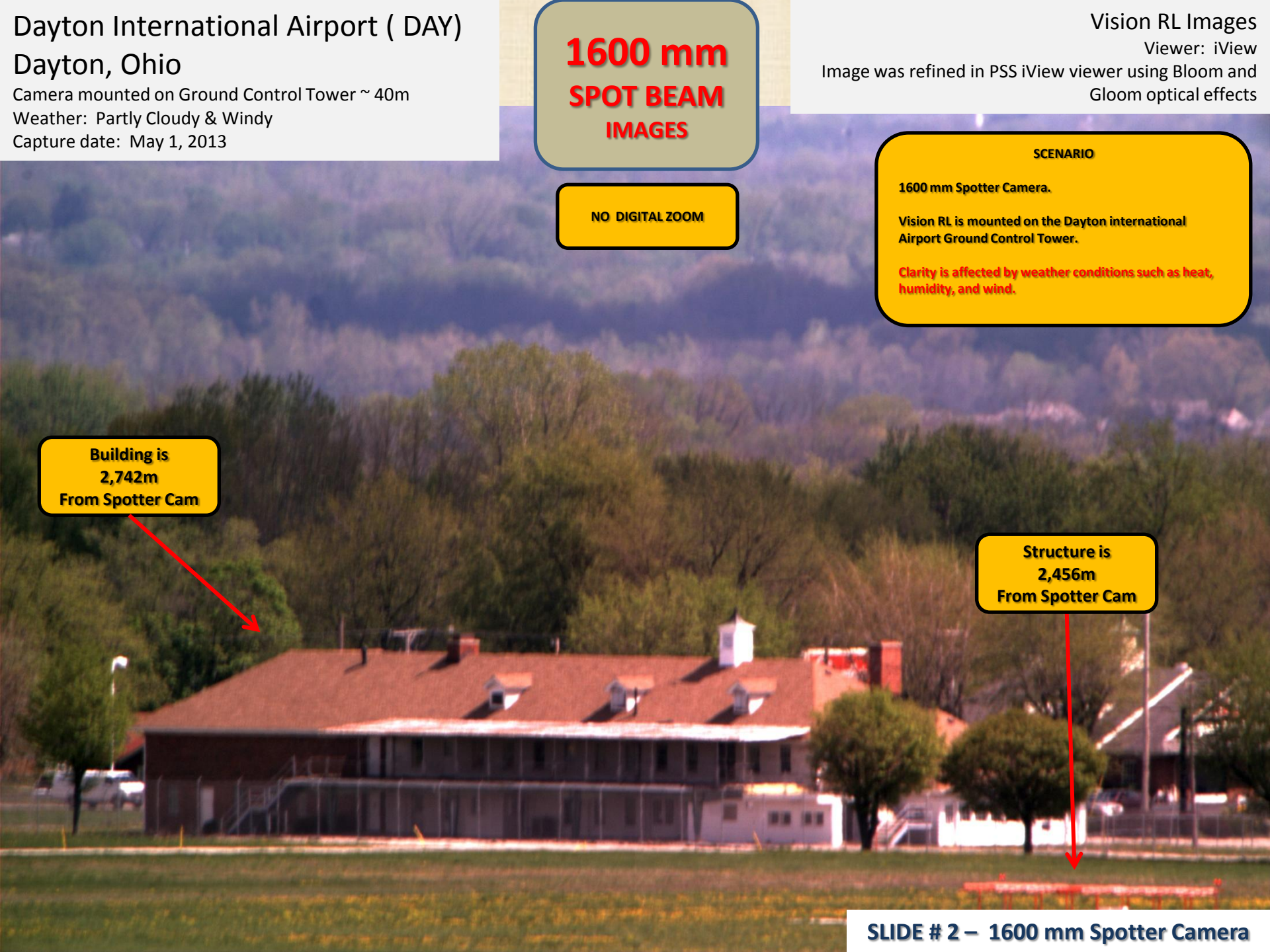
Viewer: iView

Image was refined in PSS iView viewer using Bloom and Gloom optical effects



9,400m





Dayton International Airport (DAY)
Dayton, Ohio
Camera mounted on Ground Control Tower ~ 40m
Weather: Partly Cloudy & Windy
Capture date: May 1, 2013

**1600 mm
SPOT BEAM
IMAGES**

Vision RL Images
Viewer: iView
Image was refined in PSS iView viewer using Bloom and
Gloom optical effects

NO DIGITAL ZOOM

SCENARIO

1600 mm Spotter Camera.

Vision RL is mounted on the Dayton international
Airport Ground Control Tower.

Clarity is affected by weather conditions such as heat,
humidity, and wind.

**Building is
2,742m
From Spotter Cam**

**Structure is
2,456m
From Spotter Cam**

Dayton International Airport (DAY)
Dayton, Ohio

Camera mounted on Ground Control Tower ~ 40m
Weather: Partly Cloudy & Windy
Capture date: May 1, 2013

1600 mm
SPOT BEAM
IMAGES

Vision RL Images
Viewer: iView
Image was refined in PSS iView viewer using Bloom and
Gloom optical effects

NO DIGITAL
ZOOM

- airtran.com
- Baggage Handlers



1,340 m
1600mm Spotter
Camera

SCENARIO

1600 mm Spotter Camera.

Vision RL is mounted on the Dayton international
Airport Ground Control Tower.

Clarity is affected by weather conditions such as heat,
humidity, and wind.

Dayton International Airport (DAY)

Dayton, Ohio

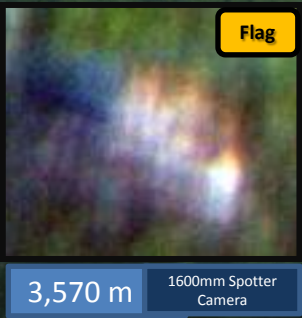
Camera mounted on Ground Control Tower ~ 40m
Weather: Partly Cloudy & Windy
Capture date: May 1, 2013

Vision RL Images
Viewer: iView
Image was refined in PSS iView viewer using Bloom and Gloom optical effects

**1600 mm
SPOT BEAM
IMAGES**

NO DIGITAL ZOOM

**Shell Gas Station
3,960m**



**Truck Terminal
3,160m**

**Perimeter Fence
2,730m**

SCENARIO

1600 mm Spotter Camera.

Vision RL is mounted on the Dayton international Airport Ground Control Tower.

Clarity is affected by weather conditions such as heat, humidity, and wind.

Dayton International Airport (DAY)

Dayton, Ohio

Camera mounted on Ground Control Tower ~ 40m
Weather: Partly Cloudy & Windy
Capture date: May 1, 2013

**1600 mm
SPOT BEAM
IMAGES**

Vision RL Images
Viewer: iView
Image was refined in PSS iView viewer using Bloom and Gloom optical effects

SCENARIO

1600 mm Spotter Camera.

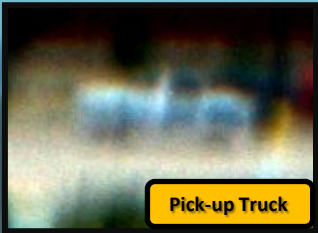
Vision RL is mounted on the Dayton international Airport Ground Control Tower.

Clarity is affected by weather conditions such as heat, humidity, and wind.

Water Tower
10,700 m

Flag
NO Flag L ZOOM

h.h. Gregg
3,960m



Pick-up Truck

Vehicles on Road

Dayton International Airport (DAY)

Dayton, Ohio

Camera mounted on Ground Control Tower ~ 40m

Weather: Partly Cloudy & Windy

Capture date: May 1, 2013

**1600 mm
SPOT BEAM
IMAGES**

Vision RL Images

Viewer: iView

Image was refined in PSS iView viewer using Bloom and Gloom optical effects

SCENARIO

1600 mm Spotter Camera.

Vision RL is mounted on the Dayton international Airport Ground Control Tower.

Clarity is affected by weather conditions such as heat, humidity, and wind.

Water Tower
3,610 m

NO DIGITAL ZOOM



SLIDE # 6 – 1600 mm Spotter Camera

Dayton International Airport (DAY)

Dayton, Ohio

Camera mounted on Ground Control Tower ~ 40m
Weather: Partly Cloudy & Windy
Capture date: May 1, 2013

**1600 mm
SPOT BEAM
IMAGES**

Vision RL Images
Viewer: iView
Image was refined in PSS iView viewer using Bloom and
Gloom optical effects

**Shell Gas Station
3,960m**

**Vehicle Traffic on
Highway
4,250m**

SCENARIO

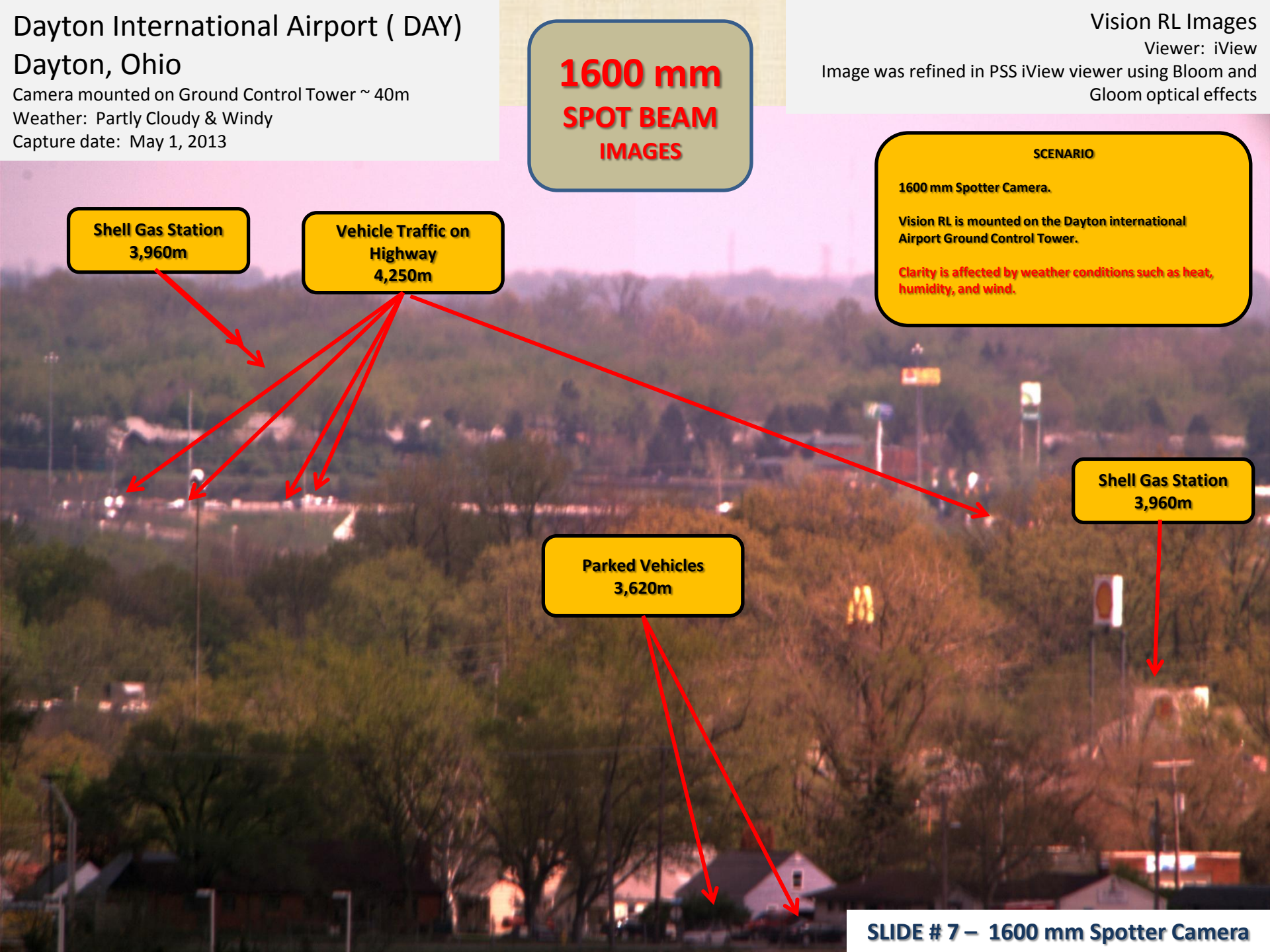
1600 mm Spotter Camera.

Vision RL is mounted on the Dayton international
Airport Ground Control Tower.

Clarity is affected by weather conditions such as heat,
humidity, and wind.

**Shell Gas Station
3,960m**

**Parked Vehicles
3,620m**



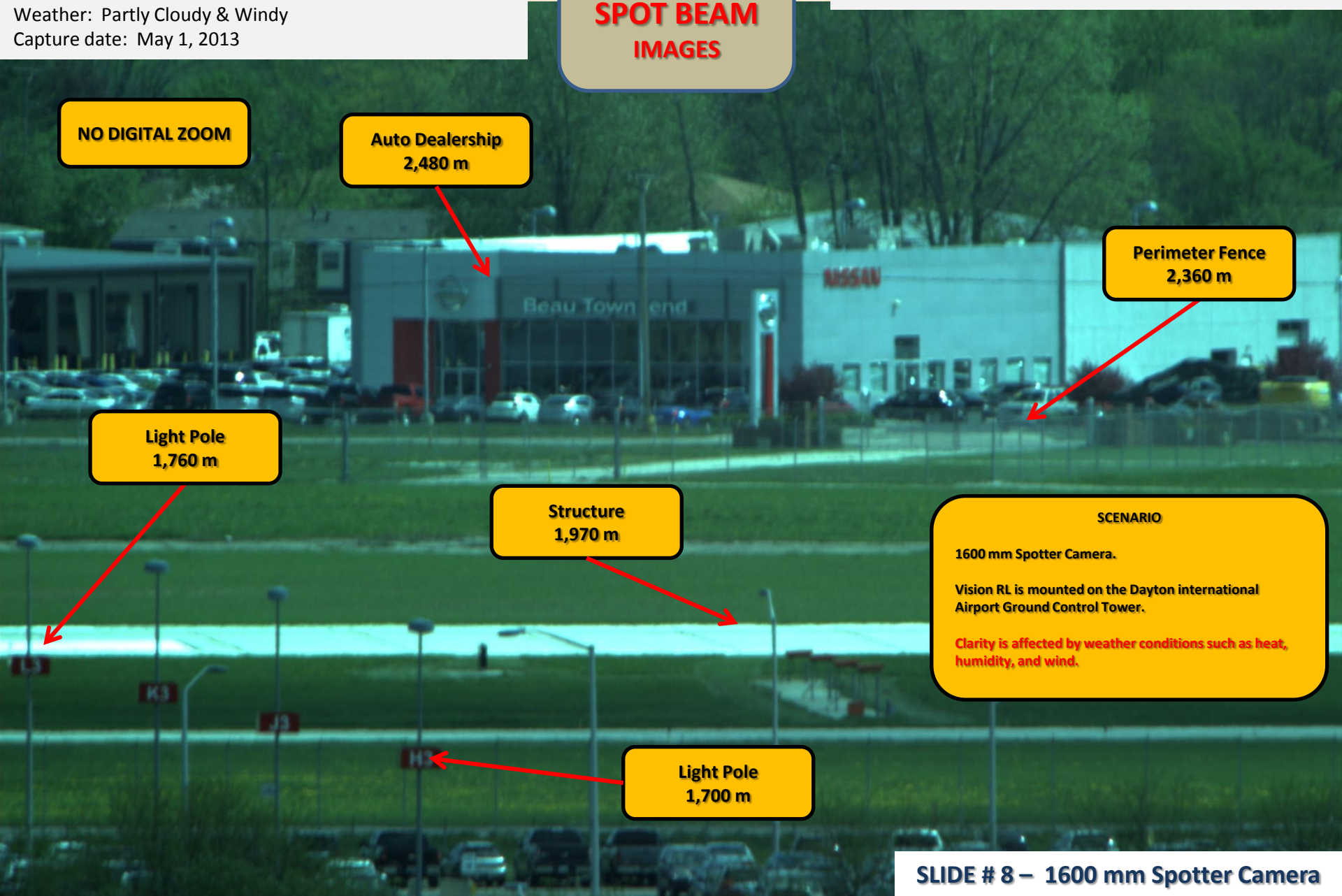
Dayton International Airport (DAY)

Dayton, Ohio

Camera mounted on Ground Control Tower ~ 40m
Weather: Partly Cloudy & Windy
Capture date: May 1, 2013

**1600 mm
SPOT BEAM
IMAGES**

Vision RL Images
Viewer: iView
Image was refined in PSS iView viewer using Bloom and
Gloom optical effects



NO DIGITAL ZOOM

**Auto Dealership
2,480 m**

**Perimeter Fence
2,360 m**

**Light Pole
1,760 m**

**Structure
1,970 m**

SCENARIO

1600 mm Spotter Camera.

Vision RL is mounted on the Dayton international
Airport Ground Control Tower.

Clarity is affected by weather conditions such as heat,
humidity, and wind.

**Light Pole
1,700 m**

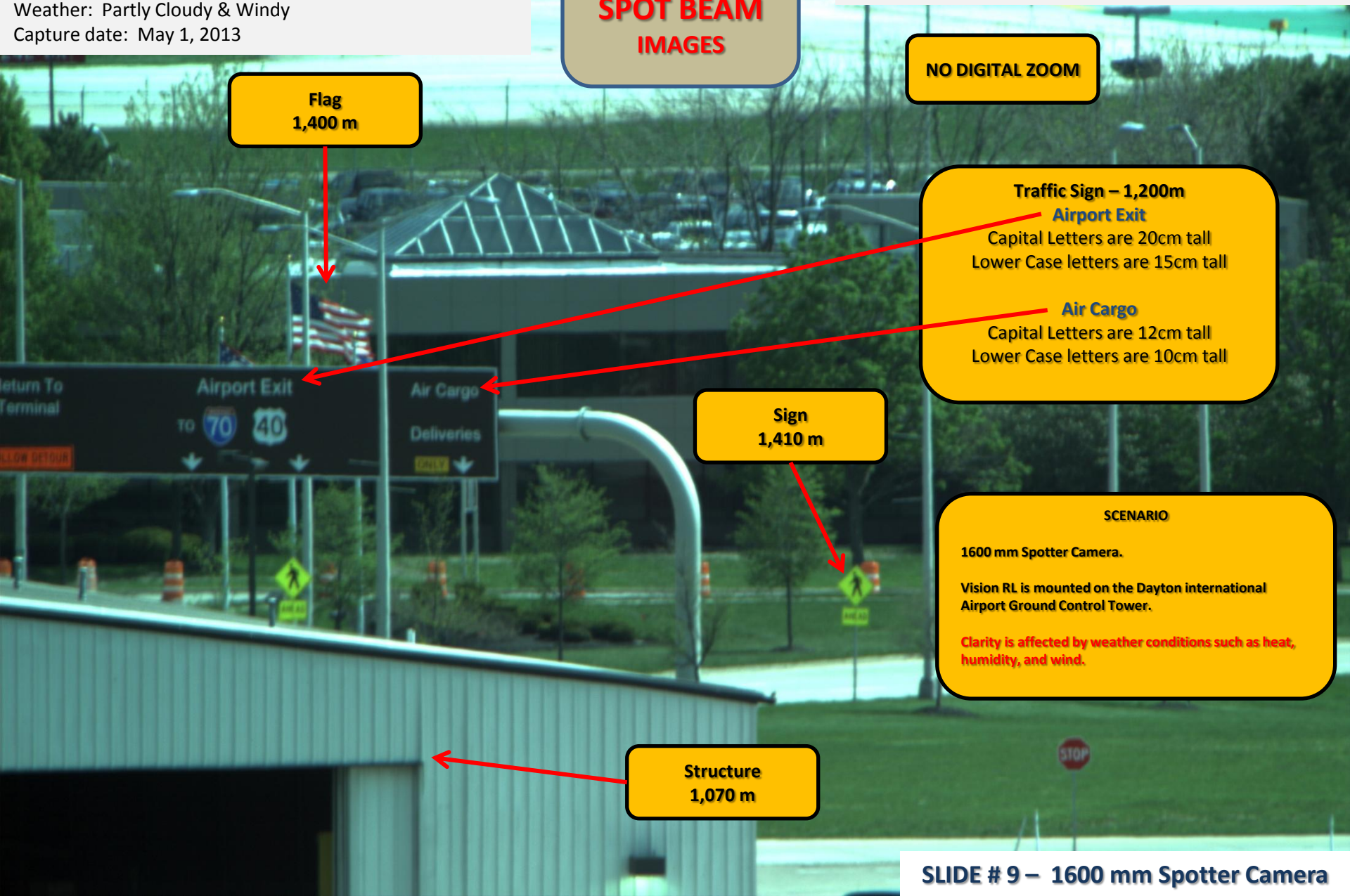
Dayton International Airport (DAY)

Dayton, Ohio

Camera mounted on Ground Control Tower ~ 40m
Weather: Partly Cloudy & Windy
Capture date: May 1, 2013

**1600 mm
SPOT BEAM
IMAGES**

Vision RL Images
Viewer: iView
Image was refined in PSS iView viewer using Bloom and
Gloom optical effects



**Flag
1,400 m**

NO DIGITAL ZOOM

Traffic Sign – 1,200m
Airport Exit
Capital Letters are 20cm tall
Lower Case letters are 15cm tall

Air Cargo
Capital Letters are 12cm tall
Lower Case letters are 10cm tall

**Sign
1,410 m**

SCENARIO

1600 mm Spotter Camera.

Vision RL is mounted on the Dayton international
Airport Ground Control Tower.

Clarity is affected by weather conditions such as heat,
humidity, and wind.

**Structure
1,070 m**

Longer Lens Capabilities

- Previous slides showed the capabilities of a 135mm, 400mm, and 800mm Spotter Camera lenses looking through a window with an ultraviolet filter.
- The 1600 mm lens was in a system mounted outside.
- Longer lenses will improve capabilities; with theoretical doubling of capabilities as lens lengths double.
- In reality, atmospheric conditions will impact capabilities.
- A more realistic measure may be to anticipate a 70 – 90% resolution improvement for each doubling of lens length. For example, where a 400 mm lens can read a street sign with 6" letters at 356 meters, an 800 mm lens may be able to read the same sign at a distance of 605 – 676 m. Similarly, a 1200 m lens may achieve the same ability at 854 – 1000 meters.
- An additional improvement will be achieved if the camera is mounted outside as opposed to behind filtered glass windows. Improvement has not been measured but could likely provide a 10 – 15% improvement. This may allow a 1200 mm lens to achieve the abilities described above at ≥ 1200 meters.

A large, white, boxy surveillance camera is mounted on a black tripod. The camera has a rectangular sensor housing on top and a larger, hexagonal base with multiple viewing ports. It is positioned on a tarmac at sunset, with a fighter jet visible in the background. The sky is a mix of orange, yellow, and blue.

VISION-RL

Persistent Vision System

- Airport Security
- Infrastructure Monitoring
- Port Security
- Special Event Coverage
- Border Surveillance
- Theme Park Surveillance
- Stadium Monitoring