

GIS and Emergency Management



Matt May
Emergency Management
And Communications



Keith Shaw
AIMS

Emergency Management Cycle



The Scenarios

Using GIS to confirm current processes are valid:

- Siren Locations



Using GIS to make the case for additional needs:

- Tornado Paths

Initial Contact

Keith

We have received a request from County Commissioner Hayden to look into the cost for putting sirens in the remaining parts of the county that currently do not have siren coverage.

Could you take the newest siren data and generate a large wall map like what we have hanging in the Radio Room with the current sirens plotted on it.

Could you also determine how many sirens it would take to provide coverage in the areas of the county not currently covered by existing sirens? I can imagine several different ways to come to this number so I leave it to you to determine the most appropriate. Then maybe produce a map with all of the new sirens on it in addition to the existing ones and their coverage areas in a different color.

Because this is a request from the BOCC there is a strong desire to get this done quickly so I think speed trumps accuracy in covering every little corner. They are just trying to get their hands wrapped around what this would cost.

I've attached the best spreadsheet I have for the data, but I think what you have been working on is better. Don't worry about the label changes we discussed.. we'll do those later.

I'm out of the office today but Dan will be in if you have questions or I'm on my cell. I'll give you a call about 0800 to see if you have any questions.

Thanks

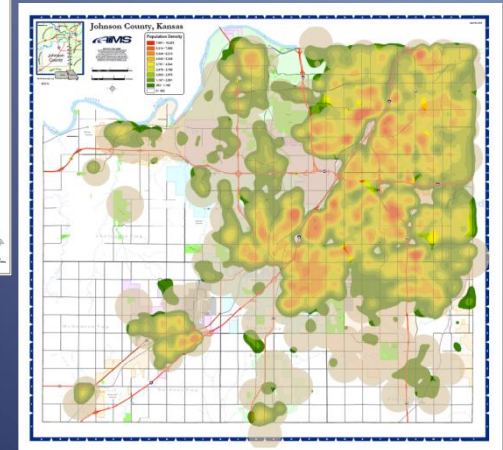
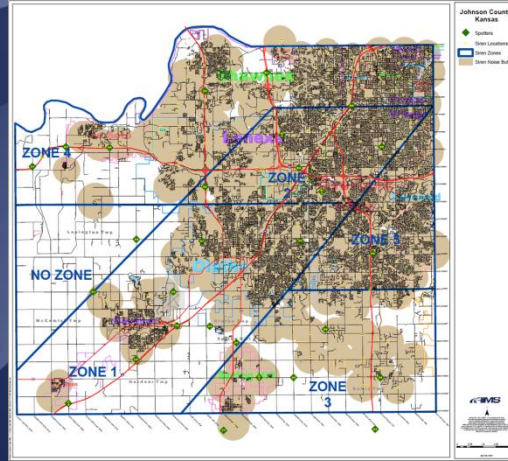
Matt

The Cheap and Easy Solution

The two new PDFs.

The big wall map –

Population –



Our PopulationModel1 currently has a total county population estimate of 572,779. There are 556,928 covered by the unioned siren buffers so that leaves a total estimate of 15,851 citizens not covered by sirens.

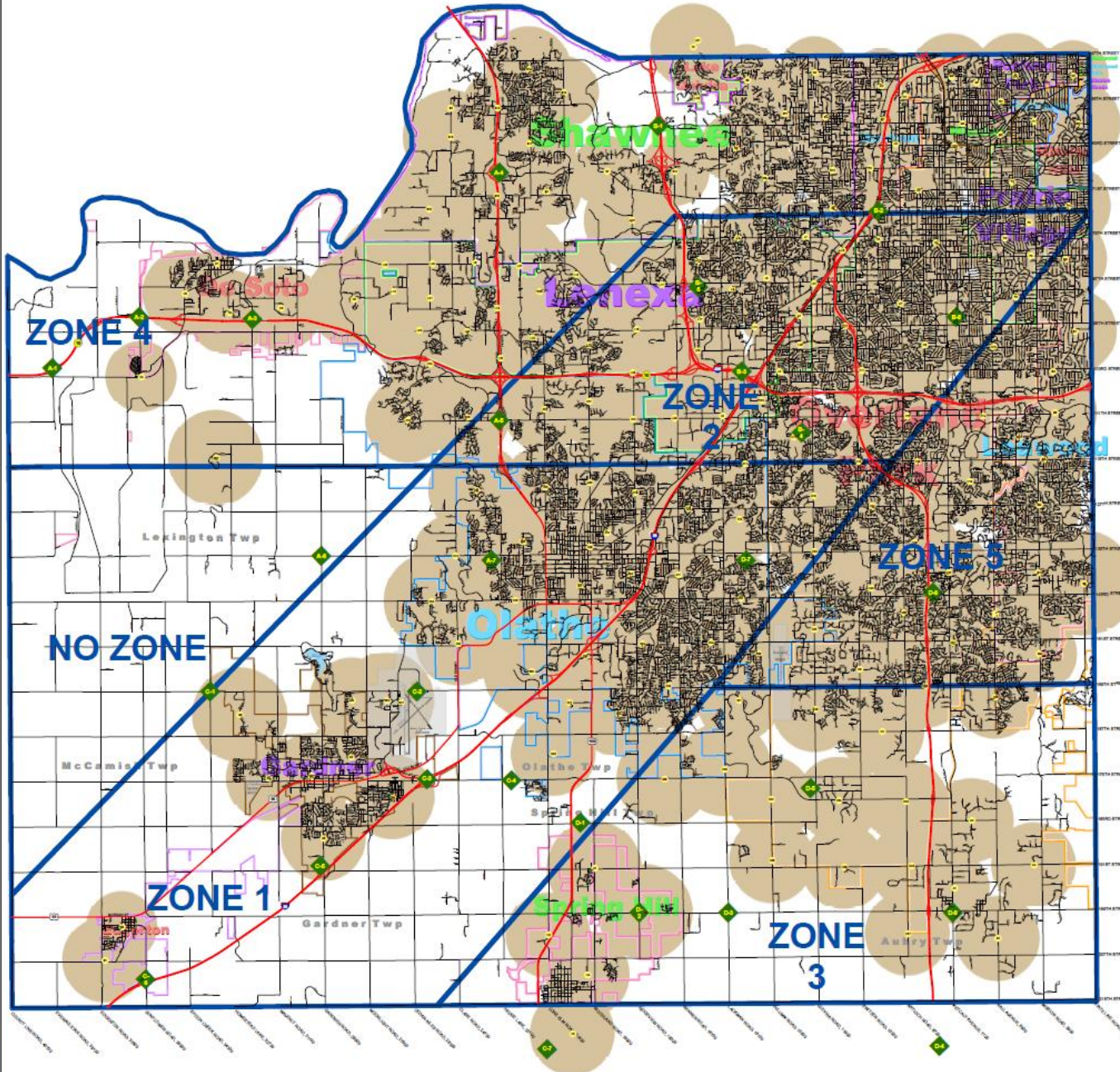
Let me know if you need anything more.

Keith

aims.jocogov.org

Johnson County Kansas

- ◆ Spotters
- Siren Locations
- ▭ Siren Zones
- Siren Noise Buffer



AMS



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0 0.75 1.5 2.25 3 Miles

April 26, 2010

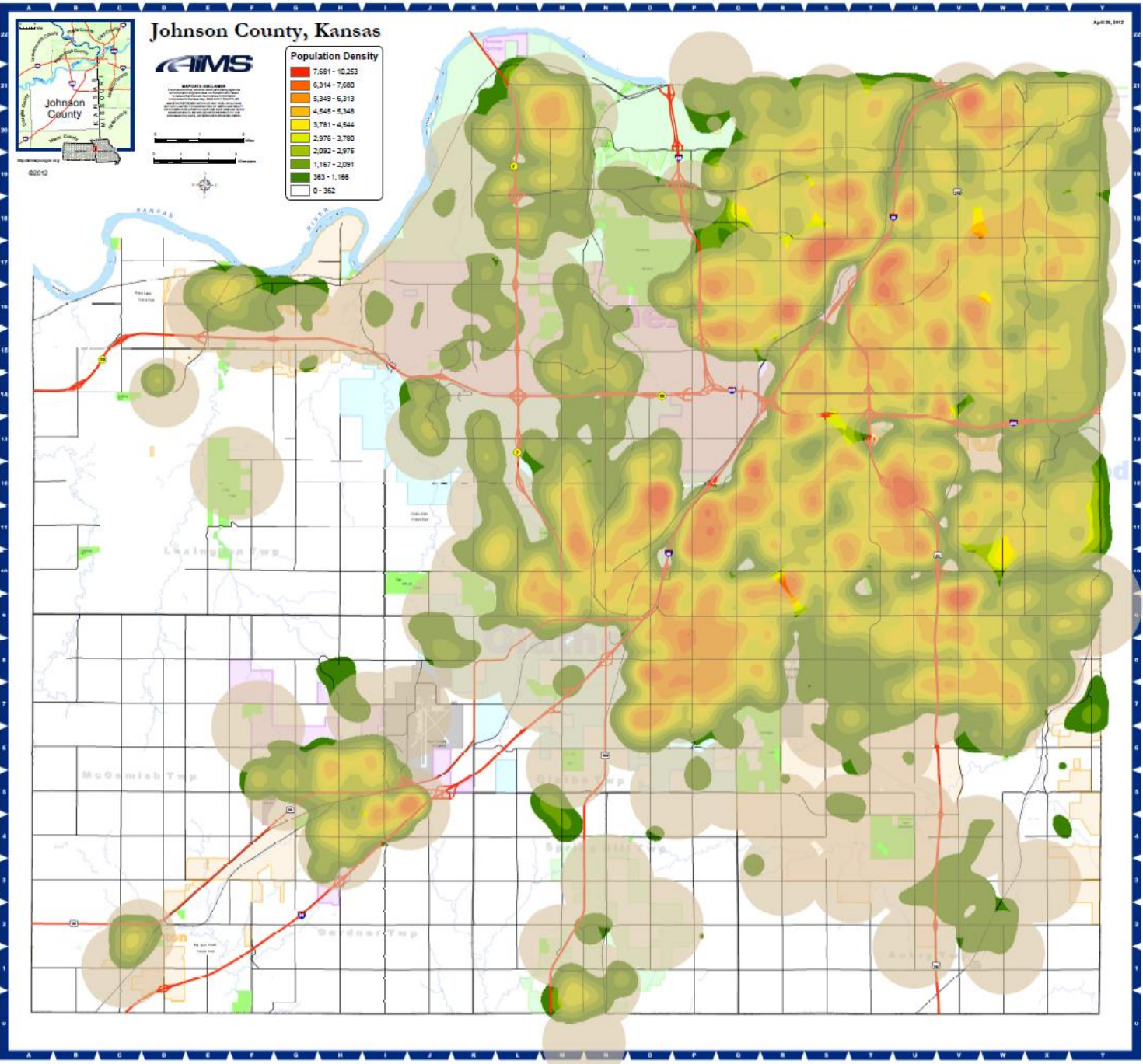
Johnson County, Kansas

April 20, 2012



MISSOURI STATE GIS
Geographic Information Systems
2012

Population Density	
7,661 - 10,263	Dark Red
6,314 - 7,660	Red-Orange
5,349 - 6,313	Orange
4,546 - 5,348	Light Orange
3,781 - 4,544	Yellow-Orange
2,976 - 3,780	Yellow
2,092 - 2,975	Light Green
1,167 - 2,091	Green
363 - 1,166	Dark Green
0 - 362	White

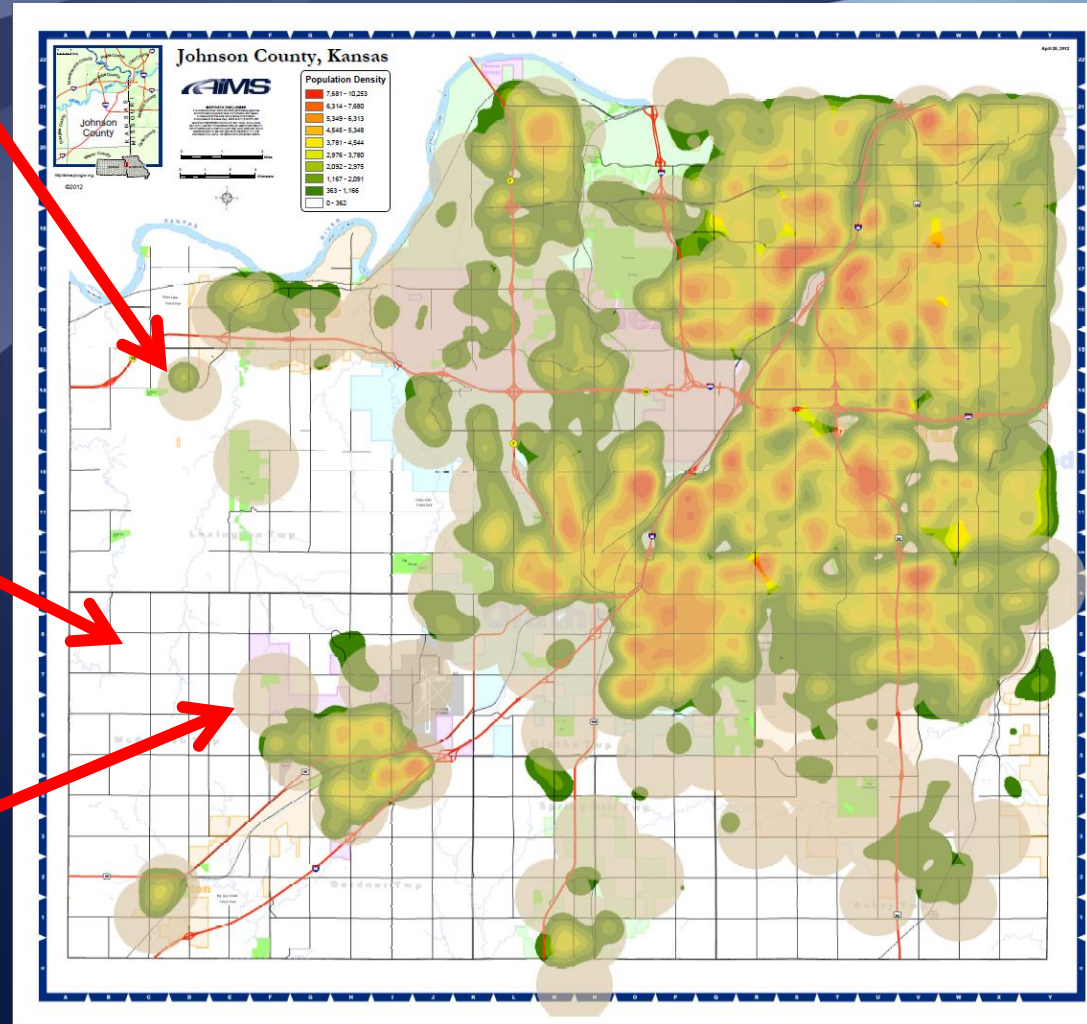


WHY DON'T I HAVE A SIREN?????

If you live here you have a siren

But if you live here you **DO NOT** have a siren!

If you live here you have a siren



And it Begins to Escalate

Follow-up Question

Keith – The maps look great - thank you. I have a few more questions I was wondering if you could help with....

1. Can you tell how many of the 15,851 citizens not covered by the sirens are in the unincorporated part of the county?
2. Can you determine the largest number of individuals covered by one siren?
3. Can you determine the smallest number of individuals covered by one (large/residential) siren?
4. Can you determine how much of our recreational areas are covered by sirens and how much is not?

These would all be very helpful figures in evaluating the situation.

Thanks so much for this!

Dan

Another Quick Response

1. 5301
2. 14780 – P5 at W 77th St & Delmar St (followed closely by 021 at 15601 W 151st St with 14428)
3. 33 – 250 at 33159 W 117th St (followed closely by O37 at 20304 Antioch Rd with 51)
4. 91% of Park_PL (includes streamway parks) is covered, 9% is not (this is for open parks)

```
DECLARE @g GEOMETRY = GEOMETRY::STGeomFromText('Polygon Empty', 3419)
SELECT @g = @g.STUnion(SHAPE) FROM jocoDev.DL.SIRENBUFFER_PL
DECLARE @c GEOMETRY = (SELECT shape FROM jocoPub.DL.CntyBnd_PL)
DECLARE @t GEOMETRY = @g.STIntersection(@c)
DECLARE @a GEOMETRY = GEOMETRY::STGeomFromText('Polygon Empty', 3419)
SELECT @a = @a.STUnion(SHAPE) FROM jocoPub.DL.City_PL WHERE Incorporat = 1
SELECT CAST(SUM(Occupants) as int) as UnincorporatedCount
FROM jocoPub.DL.POPULATIONMODEL1_PT
WHERE Shape.STIntersects(@t) = 0 and CityTwpName like '%twp%'

SELECT SUM(@t.STIntersection(a.SHAPE).STArea()) as IntersectedArea, MIN(b.TotalArea)
as TotalArea
FROM jocoPub.DL.Park_PL a
CROSS APPLY (SELECT SUM(shape.STArea()) as TotalArea FROM jocoPub.DL.Park_PL
WHERE ParkStatus not in ('Closed','Proposed','Planned')) b
WHERE a.ParkStatus not in ('Closed','Proposed','Planned')

SELECT b.NUMBER, MIN(b.ADDRESS) as Address, CAST(SUM(a.Occupants) as int) as
Count
FROM jocoPub.DL.POPULATIONMODEL1_PT a with (forceseek)
INNER JOIN jocoDev.DL.SIRENBUFFER_PL b
ON a.Shape.STIntersects(b.SHAPE) = 1
GROUP BY b.NUMBER
ORDER BY Count desc
```

```
DECLARE @g GEOMETRY = GEOMETRY::STGeomFromText('Polygon Empty', 3419)
SELECT @g = @g.STUnion(SHAPE) FROM jocoDev.DL.SIRENBUFFER_PL
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INNER JOIN jocoDev.DL.SIRENBUFFER_PL b
ON a.Shape.STIntersects(b.SHAPE) = 1
GROUP BY b.NUMBER
ORDER BY Count desc
```

The Big Mistake

I can give you the whole list for numbers 2 and 3 if you like...

**JUST DON'T
ENCOURAGE THEM**

The Next Step

Keith –

I've taken the information you've provided and put together the attached document. Can you review it and see if any errors jump out at you based on the information you've provided?

Also I have a couple more questions...

1. I would like to find out the % of "City Citizens" that are covered and the % of "Unincorporated Citizens" that are covered. To answer that, I was wondering, of the 572,799 estimated population, how many live in cities and how many live in the unincorporated part of the county?
2. You had mentioned that 91% of park & rec land was covered. Can you provide me with square footage on that?

3. If we were to put sirens in the unincorporated part of the county, how many locations are there in the unincorporated part of the county where we could cover the following number of people with one siren:

100 -200 people:

200 -300 people:

300 -400 people:

500 or more people:

If it is possible to provide me with an idea or image of where these might be, it would be appreciated.

Feel free to say "uncle" anytime if I'm asking too much of your time. I really appreciate all of the help!

Thanks, Dan

Another Round

```
declare @c GEOMETRY = (select shape from jocoPub.DL.CntyBnd_PL)
declare @t GEOMETRY = @g.STIntersection(@c)
declare @a GEOMETRY = GEOMETRY::STGeomFromText('Polygon Empty', 3419)
select @a = @a.STUnion(SHAPE) FROM jocoPub.DL.City_PL WHERE Incorporat = 1

select convert(varchar(100),convert(money,@t.STArea()),1) as SirenArea, min(c.CountyArea) as CountyArea from
jocoDev.DL.SIRENBUFFER_PL a
cross apply (select convert(varchar(100),convert(money,b.SHAPE.STArea()),1) as CountyArea from jocoPub.DL.CntyBnd_PL b) c

select cast(sum(Occupants) as int) as Count from jocoPub.DL.POPULATIONMODEL1_PT
Where Shape.STIntersects(@t) = 1

select cast(sum(p.Occupants) as int) as Count from jocoPub.DL.POPULATIONMODEL1_PT p

select cast(sum(Occupants) as int) as IncorporatedCount from jocoPub.DL.POPULATIONMODEL1_PT
Where Shape.STIntersects(@a) = 1

select cast(sum(Occupants) as int) as UnincorporatedCount from jocoPub.DL.POPULATIONMODEL1_PT
Where Shape.STIntersects(@t) = 0 and CityTwpName like '%twp%'

select sum(@t.STIntersection(a.SHAPE).STArea()) as IntersectedArea,min(b.TotalArea) as TotalArea from jocoPub.DL.Park_PL a
cross apply (select SUM(shape.STArea()) as TotalArea from jocoPub.DL.Park_PL where ParkStatus not in
('Closed','Proposed','Planned')) b
where a.ParkStatus not in ('Closed','Proposed','Planned')

select b.NUMBER,min(b.ADDRESS) as Address,cast(sum(a.Occupants) as int) as Count from jocoPub.DL.POPULATIONMODEL1_PT a
with (forceseek)
inner join jocoDev.DL.SIRENBUFFER_PL b on a.Shape.STIntersects(b.SHAPE) = 1
group by b.NUMBER
order by Count desc
```

The Final Shot

Keith –

Thanks so much for all of this.

I'll be in all day today but I can run up and get it from you. However, I see you're out now. Swing by anytime or let me know when you're back and I'll come by up there.

Also, is it a safe assumption that most of the skilled nursing facilities are covered by sirens?

Thanks, Dan

The Pay Off

Just in time for my meeting at 11 thank you thank you thank you!

Dan Robeson

Deputy Director, Emergency Management

Division of Emergency Management

Johnson County Emergency Management and Communications

913-715-1001

	With Current Siren Coverage	For Full Unincorporated Coverage
Average # of citizens covered by one siren	5,332	106
Initial cost of sirens per citizen	\$9.96	\$282.96
Annual cost of sirens per citizen	\$.17	\$4.72
Cost to provide a NOAA All-hazards radio to each person	\$16,707,840	\$265,050

The Scenarios

Using GIS to confirm current processes are valid:

- Siren Locations



Using GIS to make the case for additional needs:

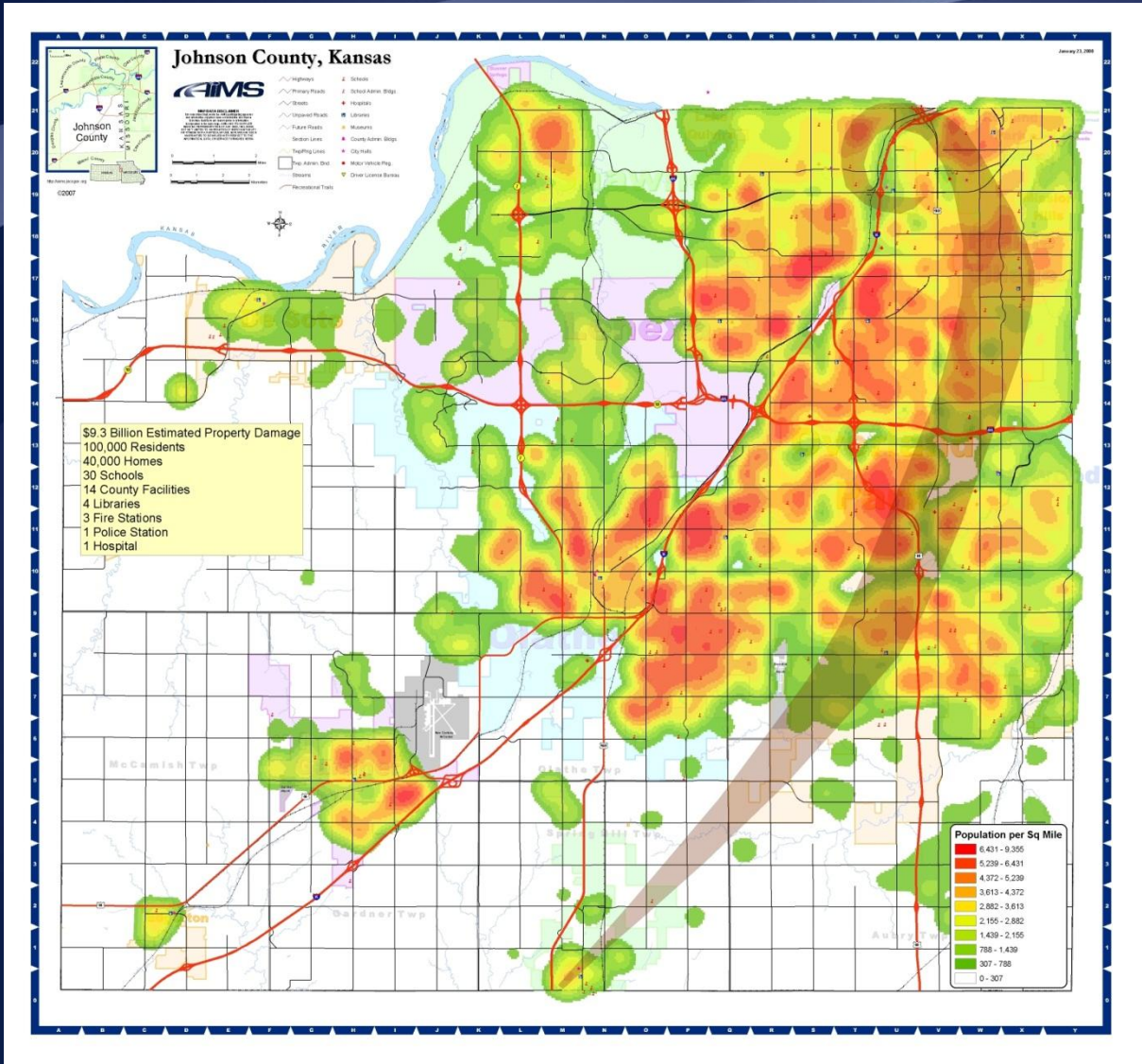
- Tornado Paths

Making The Case

- Event needs to be:
 - ❖ Recent
 - ❖ Impactful
 - ❖ Realistic
 - ❖ Scary



The Idea



A New Twist (Joplin)

- [Initial Joplin Depiction](#)
- [Getting a Little Closer](#)
- [What They Ended Up With](#)



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