

NWX-US DEPT OF COMMERCE

**Understanding Statistical Geographies
February 16, 2021**

Coordinator: Good afternoon and thank you all for standing by. For the duration of today's conference all participants lines are on a listen-only mode. Today's conference is being recorded. If you have any objections you may disconnect at this time. It is my pleasure to turn the call over to your host for today Ms. Lacey Loftin. Thank you, ma'am. You may begin.

Lacey Loftin: Good morning or afternoon everyone and thank you so much for joining us today for a Census Academy Webinar. Today we have a wonderful presenter joining us. His name is Jim Castagneri. He was telling me earlier that he has been with the Census Bureau now for 35 years. So, he has a wealth of knowledge and he is the geographic coordinator for the Denver region, so he covers 12 states, handles all of the geographic operations for basically the middle of the country.

So today he's going to walk us through statistical geography. This is really great timing especially with, you know, the pending 2020 releases. He's going to walk through not only what statistical geographies are but some of the practical uses and how things have changed over time.

A couple house keeping things. If you have any questions, please chat them. We're not going to do a live voice Q&A. But if you have any questions please include them in the chat. We will bring those questions up during the presentation if that seems like the right timing or at the very end we'll cover any questions that we didn't get to while we're going through this PowerPoint and then the live demo at the end.

You don't have to frantically take notes. We will have a copy of this presentation as well as a recording on Census Academy. And I will send that link out in the chat later on so those resources will be available to you later. Probably next week we'll have the recording in the PowerPoint available.

At the very end we will have a survey. Please take a few minutes to fill it out let us know how we did, if there is anything you'd like us to focus more or less on in the future. We really do take all the feedback very seriously so please let us know what we could do better to serve you. And then without further ado Jim are you there?

Jim Castagneri: I am. Can you hear me okay?

Lacey Loftin: I can hear you great. Okay Jim I'm going to turn it over to you.

Jim Castagneri: Thanks Lacey, thanks everybody. Good day all. I hope most of you are in and out of the cold. The weather has been a story lately and I know for Lacey herself it's been a challenge. She didn't mention it but she just got her power back on there in Texas. I'm in Denver so hopefully the power here will stay on for us. Let's all cross our fingers.

Lacey Loftin: Yes, fingers crossed.

Jim Castagneri: Welcome to our discussion about statistical geography. Let me take a moment to kind of put this topic in context for us. Through my experience working at Census and with others who are primarily concerned about the application of our data in a spatial frame whether that's GIS or another type of application that looks at the distributions of our data, a key requirement for understanding the use of the statistical data is really a basic understanding of census geography.

And so let's talk a little bit about that. And I'm going to see if I can't manage two screens at once and make sure I advanced to the proper slide.

Lacey Loftin: Very well done.

Jim Castagneri: Thank you. So, in our overview of census geography there are two main types of census geography that we're going to discuss today, and they are legal or administrative and statistical geography. Actually, we're going to focus on statistical, but we needed to mention the legal aspect. The little diagram there to the right is a little bit dated these days but it kind of illustrates for us that hierarchy of census geography.

So, what are the basics of our legal or administrative geography? Well first of all we all have a highest elected official. These can be in the form of city a mayor, a county judge or a group of county commissioners. Boundaries for these legal geographies can change at the will of a governing body and these entities can have new incorporations based on local election or regional statute.

So, what are some examples of legal or administrative geography? Of course, states American Indian reservations, counties, places -- and these are incorporated places -- congressional districts, school districts and voting districts. These are all examples of legal or administrative geography.

Let's focus our attention now on statistical geographies. For statistical geography -- and we're going to see some examples of them in a moment there are no gaps or overlaps -- these are boundaries that are created by the Census Bureau and maintained by the Census Bureau for use by the public.

They're created for statistical purposes and we're going to see some - have some discussion about that whereas political boundaries are used for elections and reapportionment and things, statistical geographies have their application in science, research, and planning. A point to mention is that the U.S. Census Bureau is the geographic data steward for the federal government. Not only are we the data steward for political geographies but we are also the data steward for these statistical geographies.

So, let's talk about some examples of statistical geography. Once again at the top we find states. Of course, the country itself is the primary entity but we tend not to talk too much about that when we're looking at an analysis of our data within our country. But at the top sits states and below the state are counties and you'll notice that there is a very close match to political geographies. But the third bullet is where the statistical geographies deviate from that political hierarchy.

We have census tracts, below that are census block groups and at the smallest level of geography is the census block. Now there are two more bullets here on the list that we're going to talk about. They are this Census Designated Places or CDPs and Census County Divisions and we'll talk about each of these as we go through our presentation.

Lacey Loftin: And I just want to jump in here. One of the obviously what a lot of us think about where we live, we think about, you know, political either legal or administrative areas so the city you live in, the neighborhood you live in. But what's really nice about statistical geographies and one of the main reasons that the Census Bureau, you know, develops them, maintain them and continues to publish so much data on for these statistical geographies is we can track changes over time. For a lot of cities and places, the boundaries are

constantly changing, same for, you know, voting districts or legislative districts.

When you compare something ten years ago if you say the city of Houston is not the same ten years ago as it is now. So, these statistical geographies really give you comparability over time and because we can control them you can really do deeper analysis either overtime or even just looking at change within a certain area.

Jim Castagneri: So, we would be remiss if we did not mention the variety of tribal statistical geographies. And while today's focus is not on tribal statistical geographies, they are a separate presentation for later in the year, it's worth mentioning that they do exist. There are tribal census tracts, tribal block groups. In these data are published along with the standard census tracts and standard block groups.

On tribal lands there are Census Designated Places. They are not differentiated from standard CDPs. But then we have across the country Tribal Designated Statistical Areas or TDSAs. There are State Designated Tribal Statistical Areas. That's a mouthful, try saying that quickly or SDTSAs. We also have Oklahoma Tribal Statistical Areas. And then there are Statistical Tribal Subdivisions.

So, these are very similar to the statistical geographies we're going to discuss today but their focus are for federally recognized tribes with federally recognized land bases. Some of them are for state recognized tribes without a land base and as you can imagine there is a whole discussion around these geographies I mentioned before. And we won't be talking about it today, but we will cover this issue in a later presentation.

So there are a couple of statistical geographies in our standard hierarchy that we need to talk about first because Lacey and I have done this presentation many times over the past several years and there are a couple of these geographies that don't quite fit in with a standard hierarchy. And one of those is the Census Designated Place. And I wondered if my colleague Lacey would take a moment to talk about these.

Lacey Loftin: I'm very happy to. Jim doesn't love these because they don't fit into these perfect nesting blocks but a Census Designated Place there are many places in the country where they have a real sense of self. People will say they live in a place, it's kind of the equivalent of a city but it's not actually incorporated. There's not actually a mayor of that area.

So, what we did at the Census Bureau was draw boundaries for these places even though they aren't actually incorporated, they're not incorporate a places but drew boundaries with help from local officials of where people can see those boundaries to be. So, there are a couple really prominent examples and one of the biggest things here I should mention is a Census Designated Place cannot overlap or be part of a real incorporated place so they are completely separate.

For those of us in Texas the Woodlands outside of Houston is a great example of a Census Designated Place. It has a real sense of place and purpose and we publish data for it just like we do for any other incorporated city, but it is not actually incorporated. It doesn't have a mayor, so it is a Census Designated Place, not a place.

And I believe on the next slide we have a couple of examples. Here we go. Here is another example so Notre Dame where the university is. There - there's not an actual incorporated place there but definitely has a sense of self

so we created a Census Designated Place so that we can produce data for it so you can look over time how things change or just even understand in the moment who's living there and what the population is.

Jim Castagneri: And Lacey I think CCDs are also your favorite. Would you mind talking about those as well?

Lacey Loftin: They are my favorite. Census County Divisions are another thing that we're going to focus mostly on these nesting geographies going forward, but this is one more we should mention. We work with local officials throughout the country to help create these. And these are just as basic as they sound so they are literally just counties or county equivalents divided up and then we name them and we publish data for those divisions of the county.

In some places it fills a gap where we're not publishing, you know, data is needed for an area and it doesn't really fall within one of these other geographical boundaries. So, I actually love Census County Divisions in that they are very flexible for local officials if they need data for an area and it doesn't fall into a different kind of geography. This is really a catchall where you can make of them there's a lot of liberal application here. So that's Census County Division.

And those are the two statistical geographies that don't really fit into this nesting hierarchy we're going to talk about going forward, but I did want to mention them.

Jim there is a question here in the chat and it's "Roughly how many CDPs are there? Do you have any idea nationwide?"

Jim Castagneri: I don't.

Lacey Loftin: Not to put you on the spot. There are a lot.

Jim Castagneri: No, but we can...

Lacey Loftin: I know in Texas we have hundreds.

Jim Castagneri: Yes.

Lacey Loftin: So in Texas we have I think yes there's definitely hundreds and hundreds of them in Texas so or hundreds of them in Texas, so nationwide you're looking at a big number there.

Jim Castagneri: Right. Travis County for example is divided into four CCDs. And CCDs are the statistical equivalent of minor civil divisions.

Lacey Loftin: Right.

Jim Castagneri: And they don't exist much east of the Mississippi. They are primarily a Western phenomenon. And the idea was, you know, hey, the West Coast has all these minor civil divisions for which there's great data why don't we have those? Well they're political. CCDs are statistical entities. And the interest in the CCDs, I should point out has faded somewhat. I know Lacey won't like me saying this. They faded somewhat because the Census tract when it was introduced nationwide in the 90s really kind of drew some interest away from that sub county statistical division which is the Census County Division.

Lacey Loftin: And that's absolutely right. And these are larger. Now we're able to publish data at a much lower geography which is much more applicable to most

people's research or planning or development. So, I don't disagree with you, I just still like Census County Division.

Jim Castagneri: And which is why we let her talk about them. she does a good job with it. Thanks Lacey.

So, let's move on now if we could to census tracts. And really if you're a geographer -- some of us are -- and you do GIS -- some of us do -- census tracts are kind of the meat and potatoes of the statistical geographies of the Census Bureau.

There's so much to say about census tracts. We don't have enough time in the day really to talk about all of the vagaries of census tract definition and design. There could be a whole classroom discussion on these. We're going to touch as much as we can on these because there's quite a bit to know about them. And so the next several slides we're going to talk about census tracts.

Comparability is probably the number one concern with census tracts Lacey, wouldn't agree with that?

Lacey Loftin: Yes absolutely. Comparability over time specifically, that's just one great application because we can track changes over time. I know you're going to go into that later in the presentation, but also comparing a census tract to another census tract because they have about the same population, so they're supposed to have around 4,000 human beings in each census tract so you can really compare. You're starting off with a baseline that is - it is similar which is a really big deal.

If you're comparing say Houston, Texas to a small town like I live in Leander, Texas and it's hard to do that because the populations are just so vastly

different. Census tracts really normalize that and give you a starting point where you can compare one census tract to another and then you can also compare census tracts over time.

Jim Castagneri: And Lacey said a key word there for me as a geographer. She said normalize it. And those of us who have done representation of really any kind of data when you're not talking about a consistent piece of geography you often have to normalize.

For example, persons per square mile. If you simply represented two distinct populations in different areas and said there are 10 million people in Houston and 500,000 people in Leander that doesn't really tell you much. So, you normalize the data by unit area.

Census tracts are designed in such a way that it's not necessarily important to normalize the data because of their criteria, their optimum of 4,000 people, the maximum of 8,000 and the minimum of 1,200. Now every time I try to talk about this minimum criteria for tracts I get a little bit confused. So once again I'd ask Lacey to comment on that minimum for census tracts.

Lacey Loftin: Yes, so we well there are some census tracts in the country that have below that 1200 population. There are many different reasons for this. One of the most common reasons is that every county or county equivalent in the country has to have at least one census tract by design. There has to be at least one census tract in every county or county or county equivalent. And there are actually a lot of counties in the country that don't have 1200 people.

So, by default there will be tracts below for that reason. We also have some special situations that I know Jim is going to talk about in one of his examples. But if there is a large area of land that is just not populated for

whatever reason we sometimes will carve that out and make it what's called a Special Use census tract. The reason we do that is that we're not diluting basically the population density of the tracts surrounding it or around it. So that's another reason you might have a census tract with a very low population.

Last but not least in some situations there is a mass migration out of an area. And so even if it started -and we're going to talk about this but these census tracts we've redo them every ten years right before the decennial census. If there was a mass migration of people out of an area with during the ten-year period it is possible that the population and the estimates will fall below that 1200 threshold.

So, we tried to keep it above 1200 because at 1200 we can publish most ACS on the American Community Survey is one of our biggest survey and one of the most rich data products that we produce. At 1200 people we are able to produce most of the main data points from the American Community Survey. So that's why we have that minimum but sometimes it does fall below that.

If it is below that 1200, we will still attempt to publish data. We just get into some situation where for making sure that we're not disclosing information about an individual or a household we might of certain data points that we can't publish in the lower, you know, we get with the population as census tracts the less data we can produce. So, we try to stay above 1200. Is that about right Jim?

Jim Castagneri: That is more than about right.

Lacey Loftin: Okay thank you.

Jim Castagneri: Thanks Lacey.

Lacey Loftin: Yes.

Jim Castagneri: I appreciate that. We are going to talk more about tracts in detail as we move forward. I'd like to cover the next piece of geography real quick, perhaps not real quick. But to put this into perspective there is yet another subdivision of census tracts. These are block groups.

Block groups their main difference between block groups and tracts - well first of all they are smaller, and they are a subunit of a tract. They nest within.

But block groups unlike census tracts are not designed to be comparable from decade from one decade to another, whereas tracts a primary tenant is that they are comparable through time, block groups are not. It's conceivable that a certain set of block groups in a single census tract have not changed across decades because the block groups were so well-defined and the population within that tract has not changed much. But ultimately block groups are not designed to be a permanent fixture like census tracts are. They...

Lacey Loftin: We actually got a couple of questions in the chat, so I was going to mention that as well. So...

Jim Castagneri: Sure.

Lacey Loftin: ...you're absolutely right. Over time it is possible that the block group doesn't change but we can't rely on that. But there were also several questions in the chat about do blocks change from decade to decade? And so, I just wanted to jump in and say they do. Blocks are another geography that we completely start over with every decennial so...

Jim Castagneri: Absolutely.

Lacey Loftin: ...the, you know, the blocks are not comparable at all decade to decade. They are just a, you know, space and time so you can use them for just what's happening on the ground now, but you can't compare them to decades before or decades later.

Jim Castagneri: Exactly. Okay so the criteria for block groups are obviously different because they are smaller. You can see the numbers there. We have housing, you know, criteria as well as population. Once again, you know, their criteria are based on a need to define what makes sense on the ground so there isn't any comparability.

The other important thing to mention about block groups -- and I have to be careful when I say this because I have a statistician on the phone with me -- is that they are the smallest area for which demographic data are available through the American Community Survey. Now as geographers and we're doing GIS work, we love to look at block groups and say look at this fine granularity of data we can use, and we can map but that can be a problem.

And I wonder Lacey before we move to this hierarchy discussion if you could tell us why that might be a problem?

Lacey Loftin: Sure. So, we will attempt to publish American Community Survey data for the block group. And Jim is absolutely right, this is the lowest geography that we even attempt to publish ACS data. But there again because it's the smaller of the population the more that we are not able to publish that we're not disclosing an individual or a household. So, we will attempt to publish data at

this block group level but there's less rich data available at the block group than tract.

Tract is really the one where we're able to publish, you know, a lot of information from the American Community Survey so that's really your richest geography from a statistical standpoint. And now is this the nesting part? This is my favorite.

Jim Castagneri: It is.

Lacey Loftin: All right.

Jim Castagneri: This is the nesting part. Are you going to take the first one Lacey?

Lacey Loftin: Sure, I can absolutely.

Jim Castagneri: Okay.

Lacey Loftin: As Jim mentioned we've been doing these presentations for - I think you shortchanged us. We've been doing this for a really long time now. And we struggled for several years to figure out how to make this nesting of census tracts, census block groups and blocks relevant and understandable to people who are, you know, applying these geographies and applying the data that comes with them.

So, we made this kind of click through chart so we can just show you how this actually happens on the ground so it's not such an abstract thing with numbers and just a lot of statistical and geography talk. But this is how it actually applies to your neighborhood or to your country, to your state your county.

As Jim mentioned every single place in the country is covered by a census block and only one census block. So, remember wherever you're standing everything is covered in the country and it's only covered by one geography. So, let's look at what that actually means in real life.

So, on this first one as Jim mentioned the USA is our starting point for all geography. But if you want to go down a level next we'll look at the state. So, I believe in this example we are looking at Texas, there we go maroon. I went to A&M gig em so here's a maroon state Texas.

So, we zoom in on this state. What we'll have is a code. So, every single state in the country or - has a code and it's the FIPS code so Texas's number is 48. So, if you were looking at a Geo ID and it says 48 you know that you're looking at Texas and only Texas.

If you go a level lower geographically, we can look at the counties. Some believe this is Travis County. This is right in central Texas where Austin is. This is where I'm sitting right now hoping the power stays on for the rest of this presentation. And every county has a three-digit code. So, if you see a Geo ID that is 48453 that means you're looking at data for Travis County, Texas.

If you go down one more level to the census tract which we're going to talk about really in-depth here because this is our most applicable geographies statistically, every census tract has a six-digit code. This is in Travis County so we're looking at tract 036000.

If we go down one more level, we get to that block group level that we were just talking about. Every block group has a one-digit code. There can only be nine block groups for tract, so this is Block Group 1.

And last but not least we're going to go down to the block level. And this is something I'm going to mention here, blocks seem like a really abstract thing when we get into the methodology and a lot of those long papers that we are able to write about something that's fairly simple.

A block is just what you think of when you're walking the dog around the block or as Jim pointed out in one presentation and I gave him a very hard time for it, the mailman, not the mailman, the milk man going throughout the block.

Jim Castagneri: The milkman.

Lacey Loftin: The milkman. So just you're literally just the closest - I mean the smallest polygon you can drive - draw. So, if you're walking around your neighborhood and you're turning right and you're turning right and turning right till you get back to your house that's what a block is for census data. Each block has a four-digit code.

So, if you're looking literally on the ground what this looks like and this first example we did a more rural area so you can see kind of comparison. Jim's going to do an example in a moment of a more urban densely populated area. But this code and it looks long and cumbersome but we're hoping to make this relatable 4845303600011006 is this piece of land. That code will tell you that you are looking at data or that these are the specific boundaries for that Geo ID and that will always be the code for that area. Again, we'll talk about how they change decade to decade, but you know for sure this is what you're looking at. There is no other piece of land in the country that has the same Geo ID.

Jim Castagneri: Perfect. You know what's frustrating is that as a geographer I always am amazed that a statistician does a better job explaining the geography than I do. So, I'm going to take a stab at it.

Lacey Loftin: No pressure. Thanks a lot.

Jim Castagneri: No pressure. I'm going to take a stab at giving another example and going through the same hierarchy with a different piece of geography. So, let's see how this looks, starting at the country level once again. And we are going to go to Texas again. Many of you may realize that the Decennial Census the Rocky Mount region was managed out of the Dallas office. That office is still open and I spent a lot of time down there over the last five years so I get to know Texas quite well.

As Lacey pointed out here we have the state of Texas and it has a FIPS code assigned of 48. Incidentally Colorado where I am currently residing has a FIPS code of 08. And it's important to mention that in our data products the FIPS codes and actually they are N-I-S-T codes now. They are character and not numeric. So, when you go to search for these codes in our data products Colorado will appear with a state code of 08. And it's important to realize that those leading zeros have to be maintained in order for GIS to function well with the data and the geographies.

All right so here we have the state code 48 Texas. We're going to zoom in to a different part of the state this time. This is Tarrant County, Texas which is Fort Worth and a wonderfully box-shaped County just like Colorado, makes me feel at home. And the yellow lines are the census tracts within the county. There are quite a few because it's quite a populated area.

If we highlight a single census tract right there in the middle we find that it also has a six-digit or six character code. In this case it's written 001017 and the way we would pronounce that is tract 10.17.

In our data products, the decimal point -- and we're going to talk about that in a little bit -- is implied two places to left of the rightmost character. So, there is no decimal point in the data. And the only time that decimal point's going to make any sense is you start looking at our map products, our PDF products that have the data printed. And in some of our older reports you'll see the tract number with that decimal point in it. But in this new world of digital analysis the tract is consistent as a six-character field.

Once again if we divide that tract into block groups in this case tract 10.17 is divided twice into two block groups. The purple block group is Block Group 2 and we have divided that block group up into census blocks.

And actually, Lacey touched on this a moment ago. The blocks are defined once every ten years after the census tract and block groups are defined through cooperative program called the Participant Statistical Areas Program and we say PSAP.

Those of you who are in the emergency management might confuse it or tend - or think I'm talking about the public service answering point. But the tract program is a better way to refer to it, really allows local governments, local planning agencies to help define the containers for the smallest level of geography, the census block by defining census tracts and block groups.

Once those are defined, we have an automated algorithm that takes the block group number and assigns a block automatically to every valid polygon within that container which is the block group. So, the tracts, the idea with the tract is

that they remain the same as much as possible. That's the primary tenet of tracts. They have target of 4,000 people; they remain the same as best as possible across decades. Within tracts are block groups and they're given a number and that number can change and the boundaries within. The block group boundaries can change.

But once that's established, that block number is established then all of the valid polygons within that block group are numbered automatically. And that's how we come up with the block numbers and that's the primary reason why blocks themselves are not comparable across decades. Lacey any comment on that?

Lacey Loftin: No, I think the next one shows what this actually looks like on the ground. We had a couple of really great questions in the chat that I want to address. One of the - well this question came up several times was, "What are block boundaries made of?" And that's a really good question.

It changes throughout the country, the most common are roads. So, we like a block boundary to be something that is stable over time, something that is visible something that you can see. So, it can be a railroad, it could be a stream, it can be a river can be a lake, roads are obviously one. Jim am I missing any major ones?

Jim Castagneri: Well political boundaries are block boundaries.

Lacey Loftin: Yes. So if there's a - so if a city ends even if it's not on a - something you can see or something that's not changing, we will make that a boundary simply so that we can produce data for it. So that's what our block boundaries are.

There was another question - there were a couple of questions about what really is a block group and that's a really great question. Sometimes when we talk about this so much we forget something that basic. A block group is literally just a group of blocks that they that - that we put together.

And the reason we do that is in conjunction with local officials. We'll say, "Okay what, you know, inside of the census tract are there any area you also need data for?" And they'll say, "Yes, we, you know, within this tract there are three distinct neighborhoods and what we'll do is make each of those neighborhoods block groups." But they are literally just a grouping of blocks and they are produced with the help of local officials so that we can produce data as needed for a local area.

Last but not least and this is really interesting. Jim and I were just talking about it yesterday and Jim I'm going to ask you to chime in on this one. We have several people who realize that there are fewer blocks in 2020 than 2010. We have a very knowledgeable audience. Jim do you mind touching on why there are fewer blocks this year because it is kind of - it's not really intuitive?

Jim Castagneri: Sure. In that tells me we have a very astute audience.

Lacey Loftin: We have a very, very impressive audience so these are going to be good hard questions.

Jim Castagneri: Yes, and those are - that's a great question. I'm actually going to do a presentation at this on this subject as early this year perhaps. I say perhaps because there's still the coronavirus. We'll see how that pans out. And so I've looked into this question.

You know, when we first defined census blocks nationwide in 1990 the thought was you - the more blocks the better, the more finely granular we can be the, better detail we can have. And we kind of went that direction from 1990 into 2000 with the thought that boy more blocks means more data and more data is always better right? And those of you who have used block level data before probably started to wonder, you know, why some of these blocks were defined in the first place because many of them didn't make sense.

Blocks, let me take a moment to try to help you understand how - why we defined them? Ultimately the notion of a census block is it's the smallest unit of geography for which we collect and publish data. The collect part is not exactly right but for our definitions when we go out, we enumerate in during the census as Lacey mentions before we tend to walk around the block and count every housing unit and all the people within it. So that's like our fundamental piece of geography.

In order to do a good count of the country we have to cover the entire country with blocks. You can't leave gaps, right? In some places like rural Texas and rural Colorado and rural West Virginia the block can be quite large because the features that make up the block boundaries are spaced far apart.

Well how do we choose those block boundaries? Primarily block boundaries are those things that make sense to be a block boundary. People live on one side of the street and on the other side of the street. They don't live in the middle of the street usually.

So, the street makes a good block boundary. The same thing is true with a city or with a river or a railroad. These are features the common sense tells us are a boundary between two areas.

We've talked about visible features primarily and most permanent visible features are block boundaries by default. They're part of a topological rule in our TIGER system that defines visible permanent features as being by default a block boundary.

We touched on before that political boundaries and statistical boundaries are also block boundaries. And these definitions are necessary so that we can tabulate the data to not just the physical definitions on the ground, but the political and statistical definitions that we create at the Census Bureau as required by law or for programs like redistricting. So, we need to be able to tabulate by whole city and be able to split areas by political boundaries.

And we also want to be able to tabulate data for areas that are defined by statistical geographies. So that census block then is that smallest elemental unit by which we don't publish data for anything smaller.

Lacey Loftin: So just to wrap back to the why there are so many fewer this year.

Jim Castagneri: I'm sorry thank you.

Lacey Loftin: It's a big deal. Jim gets really excited about blocks. He (unintelligible).

((Crosstalk))

Jim Castagneri: I do. And I - it's Lacey. I said to her...

Lacey Loftin: So, we forgot the question I could feel it.

Jim Castagneri: Yes.

Lacey Loftin: And I was going to say just...

Jim Castagneri: She - that's why she's there.

Lacey Loftin: I have a good example actually if you don't mind me jumping in here.

Jim Castagneri: Please?

Lacey Loftin: One of the things that we fixed this year in my block is one of the things we fixed. There are a lot of places where we had blocks because technically there was a polygon. I live on a cul-de-sac and there is a we call it a cactus circle.

((Crosstalk))

Lacey Loftin: The cactus circle was a block. It's just a - it was a circle. It was about 15 feet across and it was full of cactus, cacti, cactuses. I'm not sure what - how you actually say that. But that...

Jim Castagneri: (Unintelligible).

((Crosstalk))

Lacey Loftin: ...cactus circle was actually a block last time. There's another road in our neighborhood that had just a median. It was just a decorative median with grass on it. And each of these medians because they were broken up down this long street were blocks in themselves as well. This year for 2020 we fixed a lot of that. So, there were a lot of...

Jim Castagneri: Yes.

Lacey Loftin: ...things in the past same with highway medians. There were just a lot of things that we that by default were blocks really shouldn't have been. There was really no statistical application and so there were a lot of blocks where there were zero humans and zero housing. And we were able to fix that this year with these computer algorithms.

I should also mention that this is the first time that we are defining blocks by computer algorithm. In the past we literally had human beings walking each block in the country and geocoding them that way. So that's what we're doing new this time and that is how we eliminated some blocks that just weren't necessary and weren't useful for statistical purposes.

Jim Castagneri: Thanks Lacey.

Lacey Loftin: Absolutely.

Jim Castagneri: Thanks for help clearing that up.

Lacey Loftin: No, a lot of questions...

Jim Castagneri: I was going on for an hour.

Lacey Loftin: ...in the chat. I just want - no. I want to go into we're going to, you know, focus on the questions that come up repeatedly. I will absolutely email you with - if your questions are more specific or we don't get to it. We will make sure that we respond to you in email.

Jim Castagneri: Yes thanks.

Lacey Loftin: Is up next are we doing census tract lists? Is that what we're looking at?

Jim Castagneri: We are doing tracts over time.

Lacey Loftin: Okay. And we only have about ten minutes so...

Jim Castagneri: Okay let's...

Lacey Loftin: ...no pressure.

Jim Castagneri: ...make this happen. No pressure.

Lacey Loftin: Okay.

Jim Castagneri: Why don't I let you start Lacey. Why don't you take this slide.

Lacey Loftin: Oh great. Okay so make one comment about the blocks and here I am. Okay.

Jim Castagneri: Here you are.

Lacey Loftin: So, I am a statistician. I don't - actually did mention that at the beginning. But one of the best things about census tracts for me when we're analyzing data is that they are comparable over time. Now we're going to talk in a minute about how they can change but we still make sure that they are comparable from decade to decade.

So most - well let me back up. So, in 2010 there were New York City is actually where we started with the census tracts. There's an awesome presentation on Census Academy that specifically talks about census tracts in a lot of detail. But we started producing in some major urban areas in 1910 census tract. By 1990 we had full coverage for the country.

Now Jim you're going to have to remind me so most of them are called census tracts but then there was also an equivalent called...

Jim Castagneri: The Block Numbering Area, BNA.

Lacey Loftin: Okay it's a Block Numbering Area. But they were the equivalent of census tracts and they covered the whole entire country which was a really big deal because now we were publishing data for these, you know, pockets of about 4,000 population nationwide so that was a huge thing for us.

Then of course because of growth over time sometimes we have to - we're trying to keep this optimal level of 4,000 people in each census tract. And what we're about to walk you through is what we do when a census tract say in 2010 had about 4,000 people, it worked out great, we published data for it. Let's say and I know I'm using Houston a lot but that's where there's a lot of growth to and let's say it's something that went from like cow pasture now has a major development and it has 30,000 people in it. How do we, you know, make sure that the census tracts are falling in with that criteria of population but also makes comparable over time?

We are going to talk about numbering and actually how those splits go from decade to decade. And an important note to is that the only - the changes we make to tracts are done every decade prior to the Decennial Census release. So, Jim are all the tracts available now for 2020? Do you know?

Jim Castagneri: Yes, I believe they are.

Lacey Loftin: Okay that question's come up several times too. Okay and now Jim let me turn this back over to you. This is your neighborhood.

Jim Castagneri: It is.

Lacey Loftin: Yes. Yes.

Jim Castagneri: Thanks Lacey. And, you know, again I find it very helpful to have Lacey on board to talk about geography because it really has a benefit when someone who's not the geographer looks at the geography from a different perspective. And we joke about that a lot but I'm serious. That perspective sometimes is very important to help the data user understand the vagaries of the census geography.

So, let's look at an example of a single census tract in Denver, Colorado from the 2000 Census. This was the old Stapleton International Airport. If you ever flew in and out of Denver before 1995 you flew in and out of Stapleton International Airport. It was like so many other airports in the country embedded within the urban area. That wasn't the case when it was first platted in the 30s, but as the city grew up and around Stapleton Airport you can see in this actual satellite image from the late 90s -- and that explains why it's black and white -- you can see that in this imagery the runways are still there. We did cut through for the highway.

The airport had just closed in this imagery about a few years earlier. It had not been redeveloped and the population in the census tract in 1990 was 2575 people.

If we advance ten years, we can see in this new satellite image that there's been some redevelopment for Stapleton Airport. No longer was a single tract useful for that area. In fact, a special land-use tract was defined. I don't know if you can see by mouse or not. Ninety-eight zero one was a special land-use

tract defined to differentiate the commercial and industrial area from what was to become a residential area in that tract.

So what was originally tract 41.05 has now been renumbered and broken into three pieces, a special land-use tract -- and by definition it has to have its own unique number -- and two new tracts 41.06 and 41.07 using that six character definition we talked about before.

I'm going to rush a little bit because we're running short on time. I'm going to move forward ten more years and we're going to see what happens as the population continued to grow. There has been densification, redevelopment, more houses. We still have that original special land-use tract 9801 because it's still a commercial manufacturing segment.

Then we have several new tracts. Once again that those tracts splits with new numbers reflecting that the population has grown. They reached the maximum 8,000 persons and so they were subdivided. In that process in the design we are attempting to maintain comparability to past decades by using the original boundaries.

And I'm going to back up one here. And if you compare the boundaries of the 2010 census tracts with those of the 2020 Census you can see that those original boundaries are still there. They've just been subdivided into smaller units and that provides us with comparability.

Lacey Loftin: And this is really important too. Jim do you mind going back to the 2000 version?

Jim Castagneri: Sure.

Lacey Loftin: Sometimes we get a lot of questions about and can be confusing over time, so this is the original, you know, tract for this - well not the original. This is the tract from 2000 for this area.

And this number 004105 that number will always define this piece of land as it is in this picture. So, when we go forward ten years and we break it...

Jim Castagneri: Sorry.

Lacey Loftin: No, you're good. And we break it into three different tracts, these are all different numbers. So, it's not that the other one went away so we're not going to published data for that tract that we looked at. We're not going to be publishing data for it anymore, but that tract will always coincide only with that piece of land on the ground, right?

So now we're going forward and there are new numbers. So, you know that this 0041004107 is only going to be for that piece of land and same with the others.

And then if you go forward ten more years, again we're not going to still - we're not going to continue publishing data for the tracts that we had in 2010 but these new numbers are going to stay with these pieces of land on the ground and you can always be sure that these numbers coincide only to these, you know, these pieces of land on the ground, these polygons.

Jim Castagneri: Excellent.

Lacey Loftin: Okay all right.

Jim Castagneri: Thanks Lacey.

Lacey Loftin: What else do we have going on here?

Jim Castagneri: Well I think now we were going to talk about how we store all of this information.

Lacey Loftin: Awesome. And I don't know if we're going to have time for a live demo, but this is - so we're getting a lot of questions on this. There - we're going to walk through TIGER and then Jim if you have about two or three minutes just to show us where these are on our Web site that would be great.

Jim Castagneri: Sure.

Lacey Loftin: (Unintelligible) okay.

Jim Castagneri: I have that ready to roll here. So...

Lacey Loftin: Excellent.

Jim Castagneri: ...real briefly most of you who are geographers must know about TIGER. It's an acronym for Topologically Integrated Geographic Encoding and Referencing. And TIGER really was the first national topological data set in the world. It changed not only the way the census works but it changes the way GIS worked outside of the bureau as well.

Briefly TIGER is a representation of what's on the ground through a series of sorry, of lines points, polygons, and areas. And that's the relationship of features in a digital system. Today we just say GIS or Geographic Information System. And TIGER is essentially a very large digital map of the country or a Geographic Information System.

And TIGER is maintained through cooperative efforts originally built with the USGS but now the Census Bureau has partnerships with state and local governments to maintain TIGER. It's points lines and areas and that's another topic for another day but it is maintained by the Census Bureau.

And we published data from TIGER every year. And now I'm going to slide in my browser where you can get the TIGER data. Can everyone see my browser overtop there?

Lacey Loftin: We sure can.

Jim Castagneri: Excellent. So TIGER contains not only the linear features that the Census Bureau must have to manage its census and operations -- roads, railroads rivers -- but it also has the polygons that we've discussed it today, the political and administrative boundaries and the statistical boundaries that we focused on.

In order to download those for your geographic information system you can find TIGER/Line Shapefiles. And the easiest thing to do is just do a Google or Bing search -- whatever your favorite search engine is -- and search for TIGER/Line Shapefiles. And if you didn't know already Shapefile is kind of a generic term now based on ESRI's product suite.

We tend to offer these TIGER files now in Shapefile or Geo database format. You can download them directly from this Web page. For the existing and older TIGER/Line files there is a Web interface that allow you to choose the year, the layer type that you're interested in. And if you click on it and hopefully it - there we go. It allows you to choose the variety of aerial geography and linear geography for that year.

We have - do not yet have the Web interface built for the 2020 data even though we just released it, because there's a process that we have to go to make it Web friendly. So, it is available by FTP archive. So, if you click on that it's a - kind of a directory based structure and you can navigate to the state of interest and download the latest Shapefiles that way. And Lacey I think that's all we have time for unless we have questions.

Lacey Loftin: Yes, we actually do have some questions. But I wanted to make sure that we left time. Like I said, you have a very knowledgeable audience here so there are a lot of good questions. I want to make sure we can get to some of those.

I am going to screw up the term because I always do but Jim what is the file that's released every decennial so that you can compare the census tracts from 2022, you know, what...

Jim Castagneri: Yes, this is our...

Lacey Loftin: Thank you.

Jim Castagneri: Census Tract Crosswalk that we sometimes call it the Crosswalk. And its comparability file. I don't believe that's - has been released yet. That requires a fair amount of processing for us to say these tracts, this tract was that tract and so there's some relationships there that have to be established.

But we do generally make that available about the same time as the redistricting data products, so I would expect very soon that comparability file will be available.

Lacey Loftin: Okay perfect. I want to mention we had a lot of questions about other geographies that are either legal or administrative MSAs or places, incorporated places. One of our colleagues who is a geographer as well and has worked with Jim for several years now, Dorothy McKinney is going to do a presentation I believe is it May that we're planning one now to do one on...

Jim Castagneri: I think it's around May. I don't remember.

Lacey Loftin: Yes, it's in the next couple of months on those political administrative and legal geographies so keep an eye out for that. However, you heard about us today, it will be the same mechanism and we'll have that specific Webinar before, you know, the decennial data is released as well.

Last question I had here, there were a lot of questions about data that is published, what data is published for these different areas and then how you access either data from the American Community Survey or from the Decennial Census. We have several Webinars available that are recorded on the [census.gov/data/academy](https://www.census.gov/data/academy) which is where this is going to be posted as well.

There's - so if you want to learn how to download data for these different geographies there is one that is specific on finding data in data.census.gov. And that's a really great tutorial. There's actually a couple of them. It'll tell you how to pull different data from our main platform which is data.census.gov which is fairly new. So, if you're used to FactFinder we have a new platform and there is a really good - there are a couple good Webinars there to help you with that.

I think that covers - oh there was one question on ZIP Code Tabulation Areas. I want to touch on that. And then for everybody else who sent questions we will absolutely get back to you via email.

ZIP Code Tabulation Areas are just a quick touch on that. ZIP codes are just something that people know and love. Everybody knows what ZIP code they live in. A quick note on ZIP Code Tabulation Areas.

What we do is we use the boundaries - actually Jim do you want to talk about that really like in two minutes just how - what a ZIP Code Tabulation Area is...

Jim Castagneri: Sure.

Lacey Loftin: ...and how that basically freezes over a decade?

Jim Castagneri: Sure. So obviously the Census Bureau is not the administrator for ZIP codes. That's the post office. But as Lacey mentioned there's a great deal of interest in data by ZIP code. So sometime in the past I don't recall which or when, we decided we would try to create polygons that represent ZIP codes.

We can't call them ZIP code polygons because they're technically not ZIP codes. They're actually approximations. And for that we came up with the term ZIP Code Tabulation Area.

The way they were created is when we built, each decade as we build TIGER we are able to geocode an address to a location on the ground. Anytime we geocode an address with a given ZIP code at more than 50%, that entire block to which that address geocode was assigned to that ZIP code. So, it's an approximation to ZIP codes which are not true topological entities based on that algorithm.

What percentage - what ZIP code were more than 50% of the addresses in this block assigned to? And that - therefore that block was assigned to that ZIP code. And they were aggregated together into single polygon and you came up with the ZCTAs.

The last thing to know about them is we do not update them every year. It's something we create only for tabulating decennial data and unless somebody had a legal or other requirement to do it more often. And you'll only see an update once every ten years after the Decennial Census. And I do not know when that might be available. I know we're working on it now.

Lacey Loftin: Yes, and that's a really good point. So people love ZIP codes. From a statistical standpoint they can be a little tricky because they can change constantly but we do freeze them. So, we'll have a, you know, create them once for a Decennial Census and then they'll will stay the same over the next ten years.

They're really great source data source obviously. They're a really great geography and very useful for people, you know, humans on the ground to understand the data they're looking at. But do just remember they, you know, the ZIP codes can change over time and we will have them as they were at the previous decennial.

Okay so that was a whirlwind. We will definitely get back to you with any other questions. Please check out Census Academy for other Webinars on other topics, data geography -- anything else you need to know about the Census Bureau in general. And we'll have more of these coming out throughout the year especially leading up to 2020 Decennial Census release so that you guys are ready when that data comes out you'll have all the knowledge you need.

After we wrap this up in about 30 seconds there is going to be a survey that we hope that you guys will help us out and fill that out, let us know how we did, what we can do better in the future. It will take you to an external site, but we would really appreciate your feedback there.

And without further ado I think that is all. Jim is there anything else you want to say before we let everybody get back to their hopefully warmer day than mine is?

Jim Castagneri: Stay warm everyone. Thank you for attending.

Lacey Loftin: Absolutely. Thank you very much.

Coordinator: And that concludes today's conference. Thank you for participating. You may disconnect at this time.

END