

Spring 2017

# Nebraska Broadband

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## Broadband Availability Improves, But Does Nebraska Have a Rural-Urban Digital Divide?

*By Anne Byers, Nebraska Information Technology Commission*

The recent announcement by Governor Pete Ricketts, Department of Economic Development Director Courtney Dentlinger, and local officials that Facebook will be building a data center in Omaha highlights the importance of the growing technology sector in Nebraska—especially in the Omaha and Lincoln areas.

But are all areas of the state part of the Silicon Prairie? Is there a Digital Divide in Nebraska?

The [Digital Divide Index 2015](#), a recent report by Roberto Gallardo at Mississippi State University, provides some interesting insights. Nebraska fares fairly well on socioeconomic indicators, ranking 21 out of the 50 states and District of Columbia and scores a not-great-but-respectable 35 on the composite index for both socioeconomic and infrastructure measures. However, the report ranks Nebraska 48<sup>th</sup> on infrastructure measures, ahead of only Mississippi, Montana, and Alaska.

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*Broadband availability in Nebraska is improving. Broadband of at least 25 Mbps down and 3 Mbps up was available to 84.6% of Nebraskans in 2015, up from 79.3% in 2014. Nebraska ranked 34<sup>th</sup> out of the 50 states and the District of Columbia on this measure—certainly a far better ranking than the Digital Divide Infrastructure ranking of 48.*

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**TABLE 1 % POPULATION WITH BROADBAND AVAILABLE –U.S., NEBRASKA AND NEIGHBORING STATES**

State	% Population With Broadband Available 25 Mbps down/3 Mbps up (2015)
United States	90.1%
Colorado	90.0%
South Dakota	85.8%
Kansas	85.8%
<b>Nebraska</b>	<b>84.6%</b>
Iowa	81.0%
Missouri	80.2%
Wyoming	77.1%

**TABLE 2 NEBRASKA COUNTIES WITH BROADBAND AVAILABLE TO OVER 90% OF RESIDENTS**

County	Population (2015)	% Population with No Broadband Available 25 Mbps down/3 Mbps Up (2015)
Merrick	7,780	0.1
Douglas	549,168	0.8
Nance	3,596	1.5
Howard	6,392	2.1
Hall	61,422	2.6
Sarpy	175,690	2.7
Dawson	23,845	3.6
Buffalo	48,732	4.3
Lancaster	305,705	5.1
Box Butte	11,311	5.9
Adams	31,585	7.7
Richardson	8,082	7.8

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I spent days delving through the county data provided as a supplement to the report to better understand how Nebraska fared so poorly on this measure. My dive into the supplemental data shows a couple of things:

- Broadband availability in Nebraska is improving. Broadband of at least 25 Mbps down and 3 Mbps up was available to 84.6% of Nebraskans in 2015, up from 79.3% in 2014.<sup>i</sup> Nebraska ranked 34<sup>th</sup> out of the 50 states and the District of Columbia on this measure—certainly a far better ranking than the Digital Divide Infrastructure ranking of 48.
- Average advertised download and upload speeds in Nebraska also lag behind the United States and most neighboring states. Nebraska had an average advertised fixed download speed of 20.4 Mbps compared to the U.S. average of 32.6 Mbps and an average advertised fixed upload speed of 8.5 Mbps compared to the U.S. average of 12.8 Mbps.<sup>ii</sup>

*Affordability and adoption of broadband at higher speed tiers—especially in some of the state’s more rural counties—may be exacerbating the Digital Divide in Nebraska. In over half of the counties in Nebraska, fewer than 20% of households subscribe to broadband at speeds of 10 Mbps down and 1 Mbps up or greater.*

- There are significant differences in average upload and download speeds between the state’s more populous and less populous counties. Nebraska counties with populations greater than 20,000 had an average advertised fixed download speed of 36.5 Mbps and an average advertised fixed upload speed of 16.2 Mbps. In comparison, Nebraska counties with populations less than 20,000 had an average advertised fixed download speed of 16.8 Mbps and an average advertised fixed upload speed of 6.8 Mbps.
- Although the data seems to indicate that there is an urban-rural divide in Nebraska, this paints an overly simplistic picture of Nebraska. It is important to note

that some rural counties performed quite well on several of the indicators. For example, Keith County with a population of 8,062 had the highest advertised upload and download speeds in the state. Additionally, a look at the [Nebraska Broadband Map](#) shows fiber deployments in some very rural parts of Nebraska.

- Additionally, affordability and adoption of broadband at higher speed tiers—especially in some of the state’s more rural counties—may be exacerbating the Digital Divide in Nebraska. Nebraska lags the U.S. and our neighboring states in the subscription rate to higher speed tiers of broadband (10 Mbps down and 3 Mbps up or greater). In over half of the counties in Nebraska, fewer than 20% of households subscribe to broadband at speeds of 10 Mbps down and 1 Mbps up or greater.
- There are limitations to any method of ranking states. The Digital Divide Infrastructure Score was derived by first calculating county scores for broadband availability, average download speed, average upload speed, and subscription rates. The state score for each indicator was calculated by averaging the county scores. Using this method McPherson County which has no incorporated towns is given the same weight as Douglas County. This method provides a good picture of a measure across the geography of the state—but not the population of a state. Because Nebraska’s population is highly concentrated in a few counties in eastern and central Nebraska and has more counties with fewer than 1,000 people than any other state<sup>iii</sup>, this method probably disadvantaged Nebraska to a greater extent than other states.

## **Broadband Availability/Percent Population with No Access to Broadband**

Broadband of at least 25 Mbps down and 3 Mbps up was available to 84.6% of Nebraskans in 2015, up from 79.3% in 2014.<sup>iv</sup> In comparison, 90.1% of those living in the United States had broadband available to them in 2015. Nebraska ranked 34<sup>th</sup> out of the 50 states and the District of Columbia on this measure—certainly a far better ranking than the Digital Divide Infrastructure Ranking of 48. Nebraska fell in the middle of our neighboring states on this measure, ranking above Iowa, Missouri, and Wyoming but below Colorado, South Dakota, and Kansas. Table 1 shows broadband availability for the U.S., Nebraska, and neighboring states.

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Twelve Nebraska counties had broadband of at least 25 Mbps down and 3 Mbps up available to over 90% of residents. Over 1.2 million people live in these 12 counties. Table 2 shows the 12 counties with greatest availability of broadband or lowest % population with access to no broadband. As expected, many of these counties are metropolitan counties. However, several rural counties are also on the list.

Many counties in Nebraska saw significant improvements in the availability of broadband of at least 25 Mbps down and 3 Mbps up. Table 3 shows the most improved counties.

Now, let's look at the other side of the Digital Divide. Broadband of at least 25 Mbps down and 3 Mbps up was **not** available to over 95% of residents in 18 Nebraska counties. Nearly 40,000 individuals live in these 18 counties. (See

Table 4.)

## Average Advertised Speeds Per County

Average advertised download and upload speeds in Nebraska lag behind the United States and neighboring states. Nebraska had an average advertised fixed download speed of 20.4 Mbps compared to the U.S average of 32.6 Mbps and an average advertised fixed upload speed of 8.5 Mbps compared to the U.S. average of 12.8 Mbps. (See Table 5.)

A further look at the data reveals a significant difference between the state's more populated and less populated counties. Nebraska counties with populations greater than 20,000 had an average advertised fixed download speed of 36.5 Mbps and an average advertised fixed upload speed of 16.2 Mbps. In comparison, Nebraska counties with popu-

**TABLE 3 MOST IMPROVED NEBRASKA COUNTIES FOR BROADBAND AVAILABILITY**

County	% Population with No Broadband Available 25 down/3 up (2014)	% Population with No Broadband Available 25 down/3 up (2015)	Change 2014-2015
Nance	100.0	1.5	98.5
Merrick	89.0	0.1	88.9
Richardson	92.5	7.8	84.7
Burt	100.0	20.8	79.2
Wayne	100.0	22.5	77.5
Stanton	100.0	25.0	75.0
Polk	99.5	29.3	70.2
Dixon	100.0	30.4	69.6
Cedar	98.6	32.9	65.7
Nemaha	80.5	16.0	64.5
Butler	99.2	39.6	59.6
Otoe	78.4	21.7	56.7
Cuming	100.0	43.8	56.2
Jefferson	96.7	41.4	55.2
Madison	68.8	14.8	54.0
Wheeler	99.5	45.8	53.7
Howard	54.8	2.1	52.7
Saline	75.3	24.5	50.8

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**TABLE 4 NEBRASKA COUNTIES WITH NO BROADBAND AVAILABLE TO OVER 95% OF RESIDENTS**

County	Population (2015)	% Population with No Broadband Available 25 Mbps Down/3 Mbps Up (2015)
Arthur	457	100.0
Banner	797	100.0
Blaine	492	100.0
Grant	637	100.0
Hooker	733	100.0
Logan	776	100.0
McPherson	477	100.0
Thomas	686	100.0
Hayes	927	100.0
Garden	1,927	100.0
Knox	8,526	99.8
Cherry	5,829	99.7
Hitchcock	2,882	99.5
Harlan	3,447	99.5
Perkins	2,939	99.5
Sheridan	5,214	99.1
Loup	582	97.8
Frontier	2,617	96.5

**TABLE 5 AVERAGE ADVERTISED FIXED DOWNLOAD AND UPLOAD SPEEDS FOR U.S., NEBRASKA AND NEIGHBORING STATES**

State	Avg. Advertised Fixed Download Speed (2015)	Avg. Advertised Fixed Upload Speed (2015)
United States	32.6	12.8
South Dakota	65.2	45.6
Kansas	42.2	27.5
Missouri	40.0	23.0
Iowa	28.4	8.7
Colorado	27.7	7.5
Wyoming	22.6	8.4
<b>Nebraska</b>	<b>20.4</b>	<b>8.5</b>

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lations less than 20,000 had an average advertised fixed download speed of 16.8 Mbps and an average advertised fixed upload speed of 6.8 Mbps. (See Table 6.)

## Broadband Subscription to Higher Speed Tiers

In over half of the counties in Nebraska, fewer than 20% of households subscribe to broadband at speeds of 10 Mbps down/1 Mbps up or greater. Nebraska has a significantly more counties with low subscription rates to higher speed tiers than our neighboring states. In some cases the low subscription rates to higher speed tiers may be due to lack of availability of higher speed options. Affordability is also likely to be a factor. Price may be more of an issue for those in smaller communities. Research by Tim Obermier at the University of Nebraska at Kearney has found that residents of communities with populations of 5,000 or less on average pay more for broadband services<sup>v</sup>. (See Table 7.)

## Conclusions and Next Steps

While broadband availability in Nebraska is improving and currently 84.6% of Nebraskans have broadband available at speeds of at least 25 Mbps down and 3 Mbps up, Nebraska appears to be lagging behind our neighboring states and the U.S. in average advertised download and upload speeds and in subscription rates to higher speed tiers—especially in some rural areas of the state. What can we do to help address this issue? Here are my recommendations:

- Bring attention to the issue. This article is a start.
- Talk to broadband providers and officials in Nebraska in order to better understand factors impacting broadband deployment and adoption in Nebraska.
- Talk to broadband providers and officials in other states to determine what strategies are being used to promote the deployment and adoption of broadband.

**TABLE 6 AVERAGE ADVERTISED FIXED DOWNLOAD AND UPLOAD SPEEDS BY COUNTY POPULATION**

County Groupings by Population	Avg. Advertised Fixed Download Speed (2015)	Avg. Advertised Fixed Upload Speed (2015)
Nebraska (All Counties)	20.4	8.5
Nebraska Counties over 20,000	36.5	16.2
Nebraska Counties under 20,000	16.8	6.8

**TABLE 7 # AND % OF COUNTIES IN NEBRASKA AND NEIGHBORING STATES WITH LOW BROADBAND SUBSCRIPTION RATES**

State	# of Counties with low (0-19.9%) subscription rates at 10 Mbps down and 1 Mbps up or greater (2015)	% Counties with low (0-19.9%) subscription rates at 10 Mbps down and 1 Mbps up or greater (2015)
South Dakota	6/66	9%
Iowa	17/99	17%
Wyoming	6/23	26%
Kansas	32/105	30%
Colorado	23/64	36%
Missouri	42/115	37%
<b>Nebraska</b>	<b>52/93</b>	<b>56%</b>

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- Support efforts to improve broadband access at public libraries. Libraries are an important access point in communities. Providing access at higher speed tiers in libraries can help area residents better understand the benefits of higher speed broadband. Libraries are also an important community asset to address the homework gap—the inequitable situation caused by most but not all students having broadband at home to complete homework. (See related article on page 8.)
- Work with stakeholders in Nebraska to determine additional strategies and resources.

I am looking forward to getting comments and feedback from other stakeholders. You can e-mail me at [anne.byers@nebraska.gov](mailto:anne.byers@nebraska.gov) or call me at 402 471-3805.

## Notes

<sup>i</sup>The 2015 figure was calculated from the Digital Divide Index county dataset 2015 which was obtained using the FCC Form 477 December v2 data set. The Digital Divide 2015 data set is available at <http://ici.msucare.com/resources/ddi>. The 2014 figure is from the national broadband map at <http://broadbandmap.gov>.

<sup>ii</sup>The averages were calculated by averaging the average advertised download speeds for each county in the state or the United States. Using this method McPherson County which has no incorporated towns is given the same weight as Douglas County. This method provides a good picture of average advertised download and upload speeds across the geography of the state—but not the population of a state.

<sup>iii</sup>Of the 34 counties in the United States with a population of less than 1,000, 12 are in Nebraska. Texas ranks second with 8 counties with a population of less than 1,000.

<sup>iv</sup>The 2015 figure was calculated from the Digital Divide Index 2015 county dataset at <http://ici.msucare.com/resources/ddi>. The 2014 figure is from the national broadband map at <http://broadbandmap.gov>.

<sup>v</sup>Obermeir, Timothy R. (2016.) Residential Internet Access Cost in Nebraska.

## Nebraska Broadband Today! Save the Date: October 26, 2017

Nebraska's premier conference on broadband availability, adoption and broadband-related development will be held Oct. 26, 2017 at the Cornhusker Marriott Hotel in Lincoln.

Nebraska Broadband Today! will bring together economic developers, community leaders, telecommunications providers, and others to better understand how communities and telecommunications providers can work together.

A series of sessions on Broadband 101, 102, and 103 will help participants:

- Increase understanding and awareness of broadband policies and their impact on broadband deployment as well.
- Increase knowledge and understanding of how to find solutions and advocate for your community/business/community anchor institutions.



# OCTOBER 26, 2017

CORNHUSKER MARRIOTT HOTEL | LINCOLN, NE

The conference is sponsored by the Nebraska Telecommunications Association in partnership with the Nebraska Broadband Initiative.

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## Nebraska Libraries First to Participate in Broadband Toolkit Pilot

By Holly Woldt, Nebraska Library Commission  
and Tom Rolfes, Nebraska Information Technology Commission

In March, five Nebraska Public Libraries had a unique experience, participating in kick-off site visits for a pilot program funded by a *Laura Bush 21st Century Librarian Program* grant from the Institute for Museum and Library Services (IMLS). The grant was awarded to Internet2<sup>®</sup>, a member-owned advanced technology consortium founded by the nation's leading higher education institutions. The Internet2 U.S. UCAN (Unified Community Anchor Network) division spearheaded the grant application with the intent of assisting small, rural public libraries all across the United States.

This pilot program is focused on providing rural public libraries a comprehensive broadband toolkit as a series of questions with resources available for the library staff to better understand the questions or further explore a particular technology topic. The answers to the toolkit questions assist the library staff in understanding the current state of broadband at the public library as a function of the library's internal and external infrastructure and how it meets (or doesn't meet) the needs of the community.

Public library directors and staff in the Nebraska communities of Atkinson, Gering, Valley, Walthill, and Wymore each



**Wymore Public Library Visit.** Left to Right: Tom Rolfes, Nebraska Information Technology Commission; Janet Roberts, Library Director, Wymore Public Library; Susannah Spellman, Internet2; and Holly Woldt, Nebraska Library Commission.

spent a half a day with Holly Woldt of the Nebraska Library Commission and Tom Rolfes from the State Office of the CIO, who acted as the technical advisors to the five Nebraska libraries.

Library staff and technical advisors examined the details of each library's broadband profile. Susannah Spellman from Internet2<sup>®</sup> participated in site visits to the public libraries in Valley and Wymore. Ms. Spellman said, "We are delighted to partner with the Nebraska Library Commission and Network Nebraska to pilot the IMLS-funded Broadband Toolkit. Being able to leverage the library technology expertise of the Nebraska Library Commission, especially from their *Library Broadband Builds Nebraska Communities* BTOP grant, and the broadband and E-Rate expertise of the State Office of the CIO delivers an even more powerful learning experience for the library staff involved in the pilot."

The toolkit is designed to help library staff assess and evaluate their library's broadband connection and internal Wi-Fi network. Topic areas include how broadband is delivered to



**Valley Public Library Visit.** Left to Right: Holly Woldt, Nebraska Library Commission; Claire Bushong, Library Director, Valley Public Library; Anne Byers, Nebraska Information Technology Commission; Susannah Spellman, Internet2; Tom Rolfes, Nebraska Information Technology Commission; and Garren Hochstetler, Asst. Librarian, Valley Public Library.

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the library; the library's broadband provider; and infrastructure details including inside wiring, types of devices connecting the library's network, age of wiring and devices; and reliability of the library network (availability and speed). The toolkit includes links to online resources and a glossary to help guide the staff through the assessment activities. As staff work through the assessment with the technical advisors, they identify quick fixes and long-range plans that are summarized in a customized Broadband Improvement Plan for the library.

All five of the pilot libraries appreciated having an opportunity to learn about the status of the broadband in their libraries and identified improvements that could be made immediately (and in the long term) to better serve the library and their community.

"The information in the toolkit that we received will help us learn and prepare to become a bigger and better community *hot spot*. We were presented with resources, hands-on demos, suggestions, and best of all—a timeline to accomplish what will help us improve and be a better asset to our community," said Janet Roberts, Library Director, Wymore Public Library.

*Internet2 is a not-for-profit United States computer networking consortium led by members from the research and education communities, industry, and government. The Internet2 consortium began in 1996 and now connects over 250 colleges and universities, as well as 60,000 community anchor institutions.*

*Network Nebraska is a statewide consortium of public and private K-12 and higher education entities working together to improve the speed, reliability and affordability of high bandwidth fiber infrastructure. The State Office of the CIO and the University of Nebraska cooperatively administer and manage this voluntary, self-funded network that includes over 290 entities.*

## NITC Community Council Meets May 12

The NITC Community Council will meet on May 12 from 9:30 to noon at the Nebraska Public Service Commission hearing room, 1200 N Street, Suite 300. Agenda topics include:

- A discussion of Nebraska and the Digital Divide Index
- Updates on TV White Space, the IMLS/Internet2 Toward Gigabit Libraries Toolkit Project
- A discussion of public-private partnerships/coops and broadband
- Updates on the Nebraska Broadband Today! conference
- Updates on FirstNet
- Updates on Makerspaces

More information is available from the NITC website ([nitc.nebraska.gov](http://nitc.nebraska.gov)). The meeting is open to the public.

## PSC Awards NIEF Grant for Fiber Project in Rural Box Butte County

*By Cullen Robbins, Nebraska Public Service Commission*

On March 21, the Nebraska Public Service Commission (PSC) awarded a \$75,000 grant to Box Butte County from the [Nebraska Internet Enhancement Fund \(NIEF\)](#).

"These monies will be used to further efforts to ensure rural residents in Box Butte County have access to broadband and telecommunications services," said Commissioner Tim Schram, Chairman Nebraska Public Service Commission. "We would encourage local entities and economic development groups to look into applying for a NIEF grant as a way of acquiring startup funding for infrastructure projects."

The grant approved for Box Butte County will be used to help fund a project providing for the installation of fixed fiber leading to increased broadband service to 20 homes north of the city of Alliance.

Commissioner Schram said, "It is our hope this initial grant would lead to future projects focusing on the build out of fiber within Box Butte County."

Established in 2001 by the Nebraska Legislature, the [NIEF](#) uses a share of the proceeds from public entities that lease dark fiber optics to fund grants for infrastructure projects that deliver broadband or other advanced telecommunica-

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tions products. The grants focus on areas of the state that are unserved or underserved by such services today.

To date, the PSC has awarded \$735,000 in funds from the NIEF to four cities, seven counties and one cooperative across the state.

Due to the availability of additional funds, the PSC intends to open additional grant cycle for 2017. For more information on applying for a NIEF grant, visit the Nebraska Public Service website @ [www.psc.nebraska.gov](http://www.psc.nebraska.gov) and click on the NIEF Grant Information link on the homepage.

## FIRSTNET Awards Contract to ATT, Begins Working on State Plans

*By Bob Wilhelm, Office of the Chief Information Officer, State of Nebraska*

The concept of the Nationwide Public Safety Broadband Network (FIRSTNET) was created by the Middle Class Tax Relief and Job's Creation Act of 2012. The Act directed FIRSTNET to design, build and operate a nationwide interoperable wireless broadband network solely for the use of the public safety community. This network will give public safety officials the ability to send and receive data, telemetry, photo's, videos and voice without having to compete with the general public for access to the network as they do with current providers of broadband services.

Broadband and broadband applications provide public safety access to more information and enhanced situational awareness than is currently available through their land mobile radio systems.

Nebraska has engaged in outreach and educational activities to identify potential network users and stakeholders to keep them informed of the uses of the network and applications that are available to public safety users. Nebraska has also worked with FIRSTNET to provide information about our rural coverage needs and the priority of deployment for FIRSTNET as it is being built out across our state.

On March 30, 2017 FIRSTNET awarded the contract to design, build and operate the nationwide network to AT&T. This opened the door for FIRSTNET and AT&T to begin working together to design the State Plans. It is anticipated that the draft plans will be delivered to the States in early to mid-summer with FIRSTNET projecting that the final State Plans will delivered to the nations Governor's this fall (2017). The plans will identify the coverage and cost of the

network within the state. Once the State Plan is delivered that begins a 90 day period during which a Governor will need to decide if their state will opt-in or opt-out of the plan. If the Governor decides to opt-in then FIRSTNET and AT&T will build out the network in the state as described in the State Plan. If the Governor decides to opt-out then the state will have 180 days to create and deliver to the FCC, for approval, its own plan on how they would build out a network in the state that is interoperable and compatible with the FIRSTNET nationwide RAN and Core Network. The costs of such opt-out activities and build out would be the financial responsibility of the state, although there may be some grant opportunities to assist in these activities.

## PSC Chairman Schram Appointed to NARUC Leadership Position

Nebraska Public Service Commission (PSC) Chairman Commissioner Tim Schram has been appointed as Co-Vice Chairman of the Committee on Telecommunications for the National Association of Regulatory Utility Commissioners (NARUC). He was appointed to the position by NARUC President Robert F. Powelson. Elected to the PSC in 2006, Commissioner Schram was re-elected to a second six-year term representing District 3 in 2012, and currently serves as the Commission Chairman, a position he has held three time since 2006.

**Broadband Nebraska** is produced by the NITC Community Council in partnership with the Nebraska Broadband Initiative. To subscribe go to: <http://nitc.ne.gov/news/community/index.html>

The **Nebraska Information Technology Commission (NITC) Community Council** ([nitc.ne.gov](http://nitc.ne.gov)) promotes the adoption and utilization of broadband technologies in Nebraska and provides recommendations to the NITC.

**Twitter:** @NITCcommunity1

**Facebook:** <https://www.facebook.com/NITCcommunity/>



The **Nebraska Broadband Initiative** ([broadband.nebraska.gov](http://broadband.nebraska.gov)) promotes the adoption and utilization of broadband in Nebraska. Project partners include the Nebraska Public Service Commission, University of Nebraska-Lincoln, Nebraska Information Technology Commission, Nebraska Department of Economic Development, and AIM.