

Residency Audits, Day Counts, and Your Cell Phone

by Timothy P. Noonan, Andrew W. Wright, and Kristine L. Bly

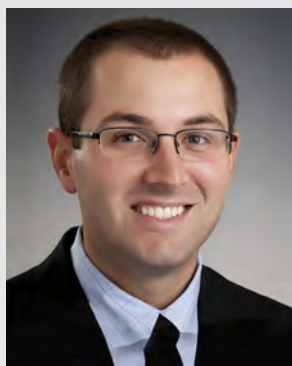
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In this installment of Noonan's Notes, the authors discuss how cell phones have affected day counts and state tax residency issues when determining tax liability, and which cellular companies provide better data to use in audits.

The authors of this column have spent considerable time working on state tax residency issues, especially those in New York. This issue has gone mainstream in recent months, with news outlets such as *The New York Times*,¹ *The Wall Street*

Journal,² Bloomberg Media,³ and even CNBC⁴ running stories about state residency audits gone wild. Much of the recent fuss — and the recent case law — has concerned how difficult it is to determine a taxpayer's "domicile," and how cases can turn on where your dog is located⁵ or where your long-lost love lives.⁶

We've also covered the other big issue that arises in these residency cases: the subtle art of counting and tracking days. While it's not the most sophisticated state tax issue, there are many interesting legal and factual issues around the counting of days.⁷ For years, this art form centered on credit card data, flight records, passport pages, and antiquated devices like landline telephones. Over the past few years, however, technology has furthered important developments in these cases, particularly with location software like Monaeo.⁸

Another technological development in the ever-evolving struggle to determine where a taxpayer is physically located may be in your pocket, on your desk, in your hand, or at least within four feet of you: your cell phone. With the exception of apps like Monaeo, nothing has affected day-counting issues and residency audits like the cell phone. Those records now form the basis of a taxpayer's — and the taxing jurisdiction's — day-count analysis in many

² Daniel Akst, "Help for Taxpayers Who Need to Prove Where They Live," *The Wall Street Journal*, Mar. 8, 2019.

³ Ben Steverman, "High-Tax States Make It Hard for the Rich to Leave," *Bloomberg*, Mar. 4, 2019.

⁴ Robert Frank, "Tax Collectors Chase Rich New Yorkers Moving to Low-Tax States. Auditors Inspect Cell Records, Even Your Dog's Vet Bills," *CNBC*, Mar. 8, 2019.

⁵ *Matter of Blatt*, DTA No. 826504 (N.Y.S. Div. of Tax App. Feb. 2, 2017).

⁶ *Matter of Patrick*, DTA Nos. 826838 and 826839 (N.Y.S. Div. of Tax App. June 15, 2017).

⁷ James B. Stewart, "Tax Me If You Can: The Things Rich People Do to Avoid Paying Up," *The New Yorker*, Mar. 19, 2012.

⁸ Timothy P. Noonan, "Resident Evil Part 3: Fighting Back With New Technology," *State Tax Notes*, Apr. 30, 2012, p. 317.

¹ Paul Sullivan, "The Teddy Bear Test, and Other Ways to Pass a State Tax Audit," *The New York Times*, Mar. 22, 2019.

audits, especially in New York residency audits. So how did we get here, how do these records work, and how can we access them? Do the cell phone carriers provide valid data?

Patience, patience. We've been fielding these types of questions from clients and colleagues almost daily — and will take a shot at answering them here.

Residency and the Importance of Day Counting

There are a few essential ways that a taxpayer's day count can affect the outcome of an audit or the size of a tax bill. First, in a domicile case in which the taxpayer is trying to prove the location of his primary home, it's important to be able to prove the amount of time spent in different states, and often the location where he slept each day. That's not easy to do with traditional day-count records.

Also, virtually every state has an alternative test for residency under which a taxpayer who maintains a residence in the state and spends more than 183 days in the state can be taxed as a resident. In New York, this test is called "statutory residency."⁹ Issues like this also arise in the income allocation context, since taxpayers often have to prove the number of days worked inside and outside the taxing jurisdiction to calculate how much wage income is subject to state taxes.

Layered over all these rules is the concept that taxpayers bear the burden of proof. So if your client cannot prove whether she was in New York on January 13, 2017, guess where she was on that day? You guessed it, New York! This puts taxpayers (and us advisers) in the difficult position of having to prove the negative — that is, to prove that the taxpayer was not in the jurisdiction at any point during the day. Here again, traditional day-count records often fall short. A credit card record showing a couple purchases in Connecticut on January 13 would certainly prove I was in Connecticut that day, but would it also prove I was not in New York? Recent case law also illustrates that testimony won't get it done either, if that testimony is vague or lacking in specificity.¹⁰

Among these difficulties enters the cell phone. The idea is simple enough: We're all carrying them around all day and using them constantly to send texts, check email, and make phone calls.¹¹ How can taxpayers — and tax departments like New York's — harness this data?

Definitions

Before explaining how this works, let's define some terms:

- **Cell tower (aka cell site):** This is not the actual site of your cell phone. It typically consists of a radio mast, tower, or other raised structure where antennae and electronic communications equipment are placed to create a cell (or adjacent cells) in a cellular network.
- **Historical cell site data:** Retention of the cell site records by the service provider detailing which cell site(s) your cell phone was connecting to at any given time.
- **Real-time:** We use this to discuss technology that provides a system of processing information in such a way that it's available for feedback either immediately, or within a relatively short period (less than a few hours).
- **Batch geocoding:** Batch or bulk conversion of latitude/longitude coordinates into addresses via application program interface or spreadsheet upload.
- **Pinging:** Query made to a cell site to determine whether a connection can be made.

Legal Limitations (or Lack Thereof)

The prevalence of cell phone data isn't just an issue in obscure New York residency cases; it has also been an important part of many criminal investigations around the country — and has even reached the nation's highest court.

In a recent decision, the U.S. Supreme Court addressed privacy in one's historical cell site data. In *Carpenter v. United States*, Timothy Carpenter challenged the district court's denial of his motion to suppress 127 days' worth of his

⁹Tax Law section 605(B)(1)(b).

¹⁰*Ruderman v. Tax Appeals Tribunal*, 2019 N.Y., slip op. 02392 (N.Y. App. Div. Mar. 28, 2019).

¹¹Except for the Noonan kids. All calls, for some reason, go to voicemail, while texts are answered immediately.

cell phone location data (which included 12,898 location points, or 101 data points per day) that was obtained by the FBI in connection with an investigation into a string of armed robberies of Radio Shack and T-Mobile stores (a bit ironic, right?). The question posed to the Court was whether the data requested from Carpenter's mobile carrier was a search under the Fourth Amendment, and if Carpenter had a legitimate privacy interest in his cell site location information. Chief Justice John G. Roberts noted in the majority opinion that "the time-stamped data provides an intimate window into a person's life, revealing not only his particular movements, but through them his 'familial, political, professional, religious, and sexual associations.'" It was that level of detail that the Court said was protected by the Fourth Amendment, even if the data is gathered and owned by a third party. Thus, in a 5-4 decision, the Court held that the government must obtain a warrant, supported by probable cause, before acquiring historical cell site records.¹²

Does this mean that tax auditors have to obtain a warrant to acquire cell data in New York tax audits? Possibly, but it's also important to understand the types of location records maintained by cell phone carriers and the data they are providing in the context of civil audits.

Real-time location data from GPS or cell towers. This is real-time information derived by pinging a target cell phone to initiate contact with a tower or connecting to the GPS receiver in a target phone. It is commonly referred to as the "911 data," because the most common use is to determine the location of a target, either with a warrant or where exigent circumstances allow authorities to do so without the use of a warrant. For instance, when authorities need to obtain the location of a 911 caller when the user is nonverbal or cannot provide their location, or in the context of amber alerts, kidnappings, missing persons, etc., this kind of data can be accessed. Notably, while a New York personal income tax audit can sometimes feel like a mugging, it is not an exigent circumstance. Plus, this would never arise in a tax case

anyway, because a tax department would never be looking for real-time data on a taxpayer's location — though maybe one day the New York residency program will graduate to real-time auditing!

Historic cell site location data. Here is where the issue arises in our tax cases. This data is one step removed from real-time location data and is created when your cell phone actually connects to a cell site. This can happen with different types of activity, such as making calls, sending texts, checking Twitter, etc. However, as opposed to the real-time locations — which can be determined even if the phone is not in use — the historical cell site data requires that your phone be active. This is where some complications arise, as we'll see later, because not all carriers provide the same type of cell site data.

In *Carpenter*, the government was looking for historical cell site location data, and the Court held that — at least in the context of a criminal investigation — a warrant was required for the historic cell site data. But the Court made it clear that this was a narrow decision. So it's unclear how or whether it would apply to civil tax cases. For now, it's usually irrelevant because not all carriers provide this kind of data. And for the ones that do, the New York State Department of Taxation and Finance likely will not attempt to get this data without the taxpayer's written, notarized consent. We'll address this in more detail later.

Different Carriers, Different Data

One more frustrating aspect is that the availability and usefulness of this data can depend entirely on the carrier. Plus, as carriers struggle with how — or whether — they are allowed to provide this data, all have different processes to allow taxpayers or tax departments to obtain the data. Moreover, the data is presented in different ways and with varying levels of detail. Taxpayers and practitioners need to know how this all works and the relevant differences among the carriers.

¹² *Carpenter v. United States*, 585 U.S. ___, 138 S. Ct. 2206 (2018).

Figure 1.

Date	Time	Number	Rate	Usage Type	Origination	Destination	Min.
3/18	3:26P	609-██████	Peak	PlanAllow	Boston MA	Princeton NJ	1
3/18	3:46P	609-██████	Peak	PlanAllow	Boston MA	Princeton NJ	2
3/18	5:33P	917-██████	Peak	M2MAllow	Groton CT	New York NY	33
3/18	6:46P	781-██████	Peak	M2MAllow	Westport CT	Incoming CL	8
3/18	7:44P	617-██████	Peak	M2MAllow	Pelham NY	Incoming CL	7
3/18	8:09P	212-██████	Peak	PlanAllow	New York NY	New York NY	2

Verizon Wireless

Verizon is probably the best carrier in terms of the availability of the data. The tax department can get it via subpoena, without even asking or notifying the taxpayer. Of course, the department does need the taxpayer's cell number. Taxpayers don't need a subpoena to get their own data. The data Verizon Wireless provides is on the billing statement and can be obtained by simply calling customer service.

But that ease of access comes with an important limitation. Verizon only provides a very general level of location detail (that is, city and state), and it discloses those details for voice activity only. And Verizon does not provide historical cell site data — which is why the data is easy to get and why a warrant would likely not be required if the tax department needed to get this data. As an illustration, see how the data is presented in Figure 1.

Call destination is simple: It is the city assigned to the area code of the number called by the target cell phone. In our example, the call destinations involving the 609 area code are listed as Princeton, New Jersey, and the 917 and 212 area codes are New York City. The call destination is irrelevant to determining the taxpayer's location, however. The important data is in the call origination field. The location listed in the call origination column is the

wireless tower from which the cell phone retrieved a signal. This is commonly referred to by Verizon Wireless as the switch/tower.

In this example, if you follow the phone calls, you can see that the individual was in Boston at 3:26 p.m. and then traveled through Connecticut to get to New York City around 8 p.m.

Your cell phone will attempt to contact various towers before retrieving a signal. Currently, and through the end of 2019, Verizon uses a 3G CDMA (code division multiple access) network.¹³ CDMA is great for users, because its method for handing off calls from tower to tower results in fewer dropped calls. But from an accuracy standpoint, CDMA can allow for the location of the cell site to be a much further distance from the location of the phone itself. As a result, Verizon records can have significant "false positives" in the call origination column, which is especially problematic in areas around the New York state or City border. For example, we often see Verizon records that show an origination location of New York City when the taxpayer is actually in Hoboken, New Jersey, or vice versa. Here's an example of how this sometimes plays out (Figure 2):

¹³Verizon, "CDMA Network Activation Retirement."

Figure 2.

Date	Time	Number	Rate	Usage Type	Origination
12/21	2:01P	██████████	Peak	PlanAllow	New York NY
12/21	2:51P	██████████	Peak	PlanAllow	Hoboken NJ
12/21	3:10P	██████████	Peak	PlanAllow	New York NY
12/21	3:40P	██████████	Peak	PlanAllow	Hoboken NJ
12/21	3:51P	██████████	Peak	PlanAllow	Hoboken NJ
12/21	4:04P	██████████	Peak	PlanAllow,M2M	New York NY

In this example, the cell data suggested that the taxpayer was in New York City, then New Jersey, then New York City, then New Jersey, etc., all within an hour or so. However, using other third-party records, we knew the New York location was a false positive. The taxpayer was not running back and forth into Manhattan every half-hour. But this illustrates the kind of issue that can make the Verizon data unreliable in cases when the taxpayer spends a lot of time close to the New York border.

Verizon also produces an origination location for incoming calls made through call forwarding and for Wi-Fi calling. But this data ends up being meaningless, because the origination location for both functions will not return the cell site location. Rather, like the call destination location, it will simply show the city and state assigned to the area code of the subscriber (that is, for 212, 332, 646, or 917 area codes it will show "New York, NY" in the call origination column). Historically, Verizon distinguished call forwarding or Wi-Fi calling activity under the "usage type" column of the statements. With some Verizon Wireless plans beginning in late 2016, that column no longer appears on the billing statements. As a result, when examining billing statements for 2017 and forward, extra care needs to be taken to identify these issues.

AT&T

We've had better luck with AT&T. Unlike Verizon, AT&T will provide incredibly detailed cell site location records (down to the latitude and longitude coordinates of the tower) for incoming and outgoing voice calls, SMS (text), and data

activity. Or at least this is the data that AT&T provides to the taxing jurisdiction. AT&T customers can also obtain detailed cell site location records. However, the first nuance with AT&T is that it will limit its response to a customer's request to the cell site location records, by providing only outgoing activity, not incoming. The records the customer can get may be slightly more limited than what the government can obtain.

The records can also be more difficult to obtain. Unlike Verizon, AT&T will not release any cell site location records without notarized consent from the account custodian, regardless of whether the tax department or taxpayer is asking for the information. For those with personal cell phone accounts, the account custodian is the person who maintains the account. However, for those with cell phones on a corporate account, the account custodian is likely someone in the IT or accounts payable department of the company. So for taxpayers with AT&T accounts, New York's tax auditors have to chase down the account custodians to get the records.

Of course, given the treasure trove of location data AT&T provides, it may be worth it. AT&T uses GSM (Global System for Mobile) technology, which requires a higher density of cell phone towers. As a result, we have seen fewer of the false positive issues than with Verizon. But because AT&T provides historical cell site location detail in latitude and longitude coordinates, these records must be converted to be of use in residency audits. The reports AT&T produces for one year of activity can often contain more than 10,000 latitude and longitude coordinates.

Figure 3.

Item Number	Conn. Date	Conn. Time (UTC)	Seizure Time	ET	Originating Number	Terminating Number	IMEI	MSI	CT	Feature	Cell Location
50	01/03/18	22:38:46	0:07	1:01	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	MO	[Wi-Fi]	[0.0:0.0]
51	01/04/18	02:11:02	0:14	2:45	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	MO	[NIOR]	[-80.0563002:26.747793]
52	01/04/18	15:27:44	0:12	1:16	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	MO	[NIOR]	[-80.0563002:26.747793]
53	01/04/18	15:29:20	0:09	4:51	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	MT	[NIOP:VCORR]	
54	01/04/18	15:29:20	0:09	4:52	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	MO	[NIOR]	[-80.0563002:26.747793]

Figure 4.

Item Number	Date	Time	House Number	Address	City	State	County	Bill Type
897	02/12/10	3:13 p.m.	1347	Southern Blvd.	Cloud Lake	FL	Palm Beach	Voice Usage For.
898	02/12/10	3:32 p.m.	1347	Southern Blvd.	Cloud Lake	FL	Palm Beach	SMS Usage For.
900	02/12/10	3:48 p.m.	258	S Military Trl.	Haverhill	FL	Palm Beach	Voice Usage For.
901	02/12/10	6:36 p.m.	0	Radar Rd.	Newark	NJ	Essex	Voice Usage For.
904	02/12/10	6:38 p.m.	272	Herbert Hwy.	Newark	NJ	Essex	Data Usage For.
905	02/12/10	6:57 p.m.	0	I- 280	Kearny	NJ	Hudson	Voice Usage For.

Consequently, the information received from AT&T must be processed through a mass geocoding system, which converts the coordinates into the street address of the tower.

As an example, see a few lines of location data from a typical AT&T cell site report in Figure 3.

We won't attempt to explain all the data here, since we will always have it converted into a more user-friendly format before analyzing the data. Figure 4 shows how it looks after the latitude and longitude data is converted into street addresses for tower locations.

Better, right? Here we see that the taxpayer was in Florida in the afternoon before flying to Newark, New Jersey. This location comes from both calls and texts, and if we followed it through, the rest of the data (not in the excerpt) would show the taxpayer entering New York City.

Note that AT&T does not provide the historical cell site data for Wi-Fi calling (identified in the feature column) — or for calls, texts, and data sent or received while in a foreign country. For these entries,

the cell location is coded [0.0:0.0], meaning no location information is available. AT&T does not store this information.¹⁴

Other Carriers

Taxpayers with Sprint, T-Mobile, Cricket, and other carriers will have a tougher time getting useful location data. In our experience, these carriers only maintain the historical cell-site data for roughly two years. Because of the time between when a tax return is filed and selected for audit (a 2018 tax return might not be filed until October 2019 and may not be selected for audit until 2020 or 2021), the two-year window for which the location data is available often does not cover the tax years under audit. Also, most of the other carriers will only release that data in response to a court-ordered subpoena.

¹⁴This is noted in the "Feature Definitions for Mobility Voice Report," which is a provided by AT&T National Compliance in response to any legal demand for data.

Figure 5.

DATA	12/20/2015	7:50:05 AM	-73.5623	41.04403	135 Harvard Ave	Stamford	CT	06902
DATA	12/20/2015	7:50:05 AM	-73.5623	41.04403	135 Harvard Ave	Stamford	CT	06902
DATA	12/20/2015	7:50:52 AM	-73.70373	41.06719	Hangar Rd	West Harrison	NY	10604
DATA	12/20/2015	7:50:52 AM	-73.70373	41.06719	Hangar Rd	West Harrison	NY	10604
DATA	12/20/2015	7:50:52 AM	-73.59444	41.10174	Merritt Pkwy	Greenwich	CT	
DATA	12/20/2015	7:50:52 AM	-73.59444	41.10174	Merritt Pkwy	Greenwich	CT	
DATA	12/20/2015	7:50:52 AM	-73.67347	41.0055	411 Westchester Av	Port Chester	NY	10573
DATA	12/20/2015	7:50:52 AM	-73.67347	41.0055	411 Westchester Av	Port Chester	NY	10573
DATA	12/20/2015	7:50:52 AM	-73.67347	41.0055	411 Westchester Av	Port Chester	NY	10573
DATA	12/20/2015	7:50:52 AM	-73.6742	41.03422	938 King St	Rye Brook	NY	10573
DATA	12/20/2015	7:50:52 AM	-73.6742	41.03422	938 King St	Rye Brook	NY	10573

Obtaining a court-ordered subpoena can be very expensive and time-consuming. So if you are a taxpayer who wants to use cell records to help in an audit, ignore the “Can you hear me now?” commercials and sign up for AT&T.

Foreign Cell Phone Carriers

For expatriates or dual citizens living and working abroad, obtaining cell phone records is hit-or-miss. U.K.-based taxpayers who have active Vodafone accounts have been able to obtain monthly cell phone statements that show the country-level location data. So while those records won't differentiate between New York and New Jersey activity, for instance, they will support the customer's presence in either the United States or a foreign country, which is extremely helpful in 548-day and foreign domicile audits.¹⁵ Of course, if a taxpayer really is in another county, it's often a lot easier to prove location through flight records, passport stamps, etc.

But Is It Accurate?

Accuracy is obviously a critical question. Can we trust these carriers' data? It depends.

When attempting to establish the strongest signal, cell phones connect to a number of cell sites within a close proximity. This becomes clear when you examine a cell phone's historic cell site data. Often this data will show a number of locations miles apart in the span of only a few minutes. No human can move that

quickly! While cell phones typically connect to the closet cell site, there are a number of factors at play, including the density of towers in the area, the tower's height, the tower's location, the time of day, and the user's location in relation to landscape, physical obstructions, and bodies of water. In short, your cellular signal is not always going to connect to the closest tower. Rather, it will seek the tower it can reach the fastest and with the best signal strength. This can also lead to “false positive” activity.

Figure 5, is an example from AT&T records the tax department obtained in an audit of a taxpayer who lived on the Connecticut-New York border.

Clearly it's impossible for an individual to be in Stamford, West Harrison, Greenwich, Port Chester, and Rye at the same time. But which tower ping is accurate? If the tax department insists that the taxpayer bears the burden of proof on all days, then this data can present complications.

Also, cell site detail attributed to data usage can be especially problematic for a different reason. We have seen many instances in which a taxpayer's location, specific to data usage, gets hung up in a single location if the phone is not used over the course of several hours or even several days. So the data ends up looking like the chart in Figure 6.

¹⁵Noonan and Andrew W. Wright, “A Foreign Language? Residency Rules With an International Spin,” *State Tax Notes*, Nov. 30, 2015, p. 661.

1903	06/09/11	8:10 a.m.	106	E 55th St.	Manhattan	NY	New York	Data Usage For.
1904	06/09/11	4:17 p.m.	117	E 68th St.	New York	NY	New York	Data Usage For.
1905	06/10/11	4:17 p.m.	117	E 68th St.	New York	NY	New York	Data Usage For.
1906	06/11/11	4:17 p.m.	117	E 68th St.	New York	NY	New York	Data Usage For.
1907	06/12/11	4:17 p.m.	117	E 68th St.	New York	NY	New York	Data Usage For.
121	06/13/11	9:26 a.m.	1042	Lexington Ave.	Manhattan	NY	New York	Voice Usage For.

In this example, the last valid location was June 9 at 4:17 p.m. Then there's only one data point on June 10, 11, and 12, and it occurs at the same time each day. Did the taxpayer just hang out at East 68th Street for three straight days and check his phone at the same time each day? It's more likely that the taxpayer wasn't using his phone at all, but had an app working in the background. And if the phone wasn't actually being used, some apps might just pull the location data from the last actual usage. It is important to recognize this type of data trailing activity, especially if the tax department is relying on location data from data usage.

What does this mean in New York residency audits? For a former New Yorker trying to prove a change of domicile to Florida and track days between the two states, some of these false positive issues are not a huge concern. Obviously, a cell phone in Florida is not going to connect to a tower in New York. And a taxpayer who takes a flight from New York to Florida will likely be able to prove that, even if his phone shows the aforementioned type of data trailing.

However, in a statutory residency audit of a New Jersey or Connecticut domiciliary who lives close to the New York border, this can be a significant issue. For example, it is not uncommon for Hoboken residents to connect to towers on the west side of Manhattan or for Greenwich residents to connect to towers in Port Chester or Rye. In short, it is important to be aware of these issues when reviewing historic cell site data. Despite these issues, such data is, and will remain, very useful in determining a person's general physical location.

Phoning It Home

There are four major takeaways here. First, the world is changing. States are more aggressive in

residency audits and more sophisticated in their audit methods. If taxpayers can't prove where they were, tax trouble will follow. Gone are the days in which taxpayers could use cash and stay under a tax department's radar.

Second, in many cases the department can get this cell phone location data whether you like it or not. And if the agency asks a taxpayer to sign a consent authorizing it to get the cellular records and the taxpayer refuses, you can expect the most negative of negative inferences to follow.

Third, not all cellular carriers are created equal. If a taxpayer wants to be in control of his cell data and use it to help count his days, he should use either AT&T or Verizon. And even between AT&T and Verizon, the AT&T data is preferable. Taxpayers with other carriers are advised to be extra careful in tracking days — and the use of one of the location-based apps, like Monaeo, is strongly recommended.¹⁶

Finally, cell phone location data can be misleading. So don't throw your arms up in the air and give up if it appears to show that your client spent too much time in New York. Indeed, it's possible that the location data is wrong. Figuring this out, of course, isn't always easy and requires basic knowledge of the technology and how the location data is presented. Hopefully the information in this article will give you a head start in figuring out these issues. ■

¹⁶ Full disclosure: The authors assisted Monaeo on the development of its app and serve as special advisers to the company.