

United States Court of Appeals For the First Circuit

No. 08-2491

OMNIPOINT HOLDINGS, INC.,

Plaintiff, Appellee,

v.

CITY OF CRANSTON; THE ZONING BOARD OF REVIEW OF THE CITY OF CRANSTON; JOY MONTANARO, Member, City of Cranston Zoning Board of Review; EDWARD DIMUCCIO, Member, City of Cranston Zoning Board of Review; CURTIS PONDER, Member, City of Cranston Zoning Board of Review; FRANK CORSO III, Member, City of Cranston Zoning Board of Review; and DONALD CURRAN, Member, City of Cranston Zoning Board of Review,

Defendants, Appellants.

APPEAL FROM THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF RHODE ISLAND

[Hon. Mary M. Lisi, U.S. District Judge]

Before

Lynch, Chief Judge,
Gajarsa* and Lipez, Circuit Judges.

Jeffrey S. Michaelson with whom Michaelson & Michaelson were on brief for appellants.

William A. Worth with whom Thomas M. Elcock and Prince, Lobel, Glovsky & Tye LLP were on brief for appellees.

November 3, 2009

* Of the Federal Circuit, sitting by designation.

LYNCH, Chief Judge. In this case a wireless carrier was denied a variance and special use permit by the Cranston Zoning Board of Review to build a wireless communications tower in Cranston, Rhode Island. The carrier had so applied in order to remedy a significant gap it found in coverage.

When the carrier sought federal court review of the denial, the city and zoning board countered that the zoning board's decision was not a "final action" because limited state court review was available. The district court rejected the argument. Omnipoint Holdings, Inc. v. City of Cranston, No. 06-531, 2007 WL 2050316, at *4-5 (D.R.I. July 12, 2007) (order denying motion to dismiss) (City of Cranston I). After a two-day bench trial, the court granted judgment for the plaintiff. Omnipoint Holdings, Inc. v. City of Cranston, No. 06-531, slip op. at 8, (D.R.I. Oct. 23, 2008) (City of Cranston II). It held that the town's denial of the permits constituted an effective prohibition of service in violation of § 332(c)(7)(B)(i)(II) of the Telecommunications Act of 1996 ("TCA"), Pub. L. No. 104-104, 110 Stat. 56 (codified as amended in scattered sections of 47 U.S.C.). Id. at 2, 8.

We now affirm. On an issue of first impression in the circuit courts, we hold that the zoning board's decision was a "final action" for purposes of § 332(c)(7)(B)(v) of the TCA. We also reject the defendants' claims that the court erred in finding that the zoning board's decision "ha[d] the effect of prohibiting

the provision of personal wireless services." 47 U.S.C. § 332(c)(7)(B)(i)(II).

I.

We recite the facts in the trial record in the light most favorable to the verdict. Marcano Rivera v. Turabo Medical Center P'ship, 415 F.3d 162, 165 (1st Cir. 2005).

T-Mobile USA, Inc. ("T-Mobile") has a Federal Communications Commission ("FCC") license to operate a digital personal communications service ("PCS") wireless network at 1900 megahertz in Rhode Island under which Omnipoint, T-Mobile's wholly owned subsidiary, operates. Omnipoint provides wireless service to customers through a network of antennae mounted on towers or other structures, often called wireless facilities, that broadcast signals between towers and to customers' wireless phones and devices. When Omnipoint realizes that an area within its network lacks sufficient coverage for customers to make and maintain calls reliably, it tries to remedy the coverage gap by building a new facility.

The key to coverage is having a strong-enough signal level for customers to maintain contact with the network so they can make and maintain calls. Signal level, the strength of the radio signal customers' devices receive, is measured in negative

decibels per milliwatt ("dBm").¹ The nature of Omnipoint's digital PCS network makes keeping signal levels strong more difficult than if it had provided analog-based cellular service. PCS towers broadcast lower signals at a much higher frequency, so those signals cover a smaller area, usually about 1.5 miles. Consequently, PCS providers must build a network of towers relatively near each other, creating an overlapping grid of signals from the towers resembling a honeycomb. For example, Omnipoint has at least sixteen towers within four miles of the proposed tower at issue in this case.

Because its customers value reliable network coverage, Omnipoint has established a national goal of 95 percent reliability for the network, meaning that customers should be able to make and maintain 95 percent of their calls. To meet this goal, Omnipoint has established -84 dBm as its minimum signal strength for in-vehicle coverage nationwide. Federal law does not require any specific signal level; Omnipoint has set high standards to satisfy its customers.

Omnipoint first determined that signal levels around Phenix Avenue in Cranston fell below -84 dBm through a propagation study, a computer program that predicts signal levels. Phenix Avenue is heavily traveled because it is a main road connecting

¹ Because it is measured in negative figures, the larger the dBm number, the weaker the signal. Thus a signal strength of -100 dbm is weaker than a signal of -80 dbm.

Cranston to the nearby towns of Warwick and Coventry. A consulting engineer for Omnipoint, Elijah Luutu, determined that Omnipoint likely needed a new facility in the area to service this traffic. Later he conducted a drive test, during which he drove a wireless device around the area and mapped the signals it was receiving, which confirmed this conclusion. Based on the propagation study, Luutu designed a "search ring" for Omnipoint staff to find potential locations for the new facility around November 18, 2003. Factoring in topography and the height of the area's tree canopy, Luutu calculated that Omnipoint needed to build or find a ninety-foot pole for the new facility.

Omnipoint employees examined the search ring for suitable sites. They looked, in order of preference, for existing towers belonging to other wireless companies, existing structures to mount a facility on, and raw land to construct a facility on. They also considered the ease of building a new facility, the radio frequency needs of the area, and zoning issues when evaluating candidates. An employee searched the area and FCC databases and did not find suitable existing towers, so that option was excluded. He identified four potential sites: the Cranston Fire Department Museum, two different sites at the Cranston Country Club, and the Solid Rock Church. No other structures in the search ring were tall enough to meet Omnipoint's radio frequency requirements. Luutu rejected the museum site because it would provide largely

redundant coverage with another tower without covering most of the gap.

With the exclusion of the museum site, Omnipoint came down to three options: an extant utility pole or raw land (to put up a pole) on the country club's property, or land on the property of the Solid Rock Church in Cranston. Omnipoint first negotiated with the country club. Omnipoint needed an easement to install power lines to the proposed facility on the country club's utility pole, so it offered the country club first its standard rate of \$1,500 and then its enhanced lease rate of \$2,000 per month. The club rejected both offers on the ground that installing power lines could damage its golf course's fairways. Omnipoint then offered the country club both the \$1,500 and \$2,000 lease rates to build a facility on the club's raw land. When the club's three owners could not agree whether to pay the lease proceeds to themselves or to the club, Omnipoint offered a one-time payment of \$25,000 (in addition to the monthly rate) to whichever owner would agree to the other side's position. The owners refused to compromise, however, and Omnipoint abandoned negotiations with the country club.²

Omnipoint then turned to the property of the Solid Rock Church and offered \$1,500 per month to lease the raw land to construct a ninety-foot tower disguised as a flagpole. The church

² The record suggests Omnipoint negotiated with the country club for about five months in total.

accepted. It is this site which is the subject of this controversy. The pole was not in conformance with Cranston's zoning ordinances because, given its height, it was too close to the property's southern border. Omnipoint and Solid Rock Church jointly applied for a variance and special use permit on September 21, 2005, almost two years after Omnipoint began searching for a site.

On November 9, 2005, the City of Cranston Planning Commission, which may offer nonbinding recommendations to the zoning board, held a public hearing and issued a written recommendation that the board deny Omnipoint's application because Omnipoint did not "demonstrate[] that existing nearby facilities c[ould not] accommodate the service need." The Cranston Zoning Board of Review then conducted two public hearings on April 12, 2006, and September 13, 2006. The board issued a written decision on November 7, 2006, denying Omnipoint's application without then giving a statement of the reasons for its decision.

II.

Omnipoint sued the city, the zoning board, and all five members of the zoning board (collectively "Cranston") in federal district court on December 6, 2006, under the TCA. It claimed that Cranston had violated the TCA because it had effectively prohibited the provision of personal wireless services by refusing to grant

Omnipoint's application.³ Omnipoint sought an injunction requiring the board to grant Omnipoint's request for a variance and special use permit and an injunction and order of mandamus ordering the city of Cranston to issue a building permit for constructing the tower.

Cranston moved to dismiss Omnipoint's complaint, arguing that the district court lacked what it referred to as subject matter jurisdiction. Because Rhode Island law permits parties to petition the state superior court for limited review of a zoning board's decision, Cranston contended, the zoning board's decision was not a "final action" creating federal jurisdiction under § 332(c)(7)(B)(v). The district court rejected the argument and held the board decision was a "final action" and that the TCA permitted Omnipoint to bypass Rhode Island state court review. City of Cranston I, 2007 WL 2050316, at *4-5.

The district court held a two-day bench trial on June 27 and July 9, 2008, and heard five witnesses. Gerald Marquis, a real estate manager for Omnipoint, testified that Omnipoint held an FCC license to operate at 1900 megahertz and explained that Omnipoint sets a 95 percent nationwide reliability standard to satisfy

³ Omnipoint also claimed the board failed to support its decision with substantial evidence because the board gave no reasons for denying Omnipoint's application. See 47 U.S.C. § 332(c)(7)(B)(iii). During litigation Cranston provided Omnipoint with a comprehensive explanation for the denial that the board kept on file. In response, Omnipoint has dropped its substantial evidence claim.

customers. Marquis also testified to Omnipoint's process for identifying and remedying gaps in coverage. Two Omnipoint employees described their efforts to find a location for the new facility around Phenix Avenue.

Elijah Luutu, who has designed wireless networks as a radio frequency engineer for twelve years, testified as an expert witness for Omnipoint. Luutu detailed how Omnipoint calculated -84 dBm as its minimum signal level in vehicles. It began with a receiver sensitivity--that is, the minimum decibel levels that mobile devices and base stations need for people to understand someone on the other line--of -102 dBm based on industry standards. Omnipoint added attenuation from obstructions that could block a signal, such as bodies, trees, and buildings, which produced the -84 dBm figure. According to Luutu, the -84 dBm standard ensured Omnipoint met its goal of 95 percent reliability.

Luutu also explained how he created a search ring and evaluated candidates for a facility around Phenix Avenue based on Omnipoint's specifications. He acknowledged he could have studied building multiple, smaller sites to cover the gap, but Luutu only considered building a single tower because Omnipoint instructed him to. Although no proposed site would fully remedy the coverage gap around Phenix Avenue, Luutu, accepting that the country club was unavailable, concluded a tower on the property of the Solid Rock Church was Omnipoint's best alternative.

Cranston presented only one witness, David Maxson, whom it presented as a purported expert. Maxson had never built a wireless network and most of his training and experience was in radio broadcasting. He had, however, worked for a wireless company and had advised municipalities on regulating wireless facilities. Maxson's testimony went to two points: he contended there was no gap and, if there were, Omnipoint had alternative solutions. These conclusions were generally consistent with an earlier affidavit he had filed. But he admitted that when he assembled that affidavit, he had never visited the area around Solid Rock Church, had performed no tests there, and had made no computer studies to support his opinions in the affidavit.

Maxson attacked how Omnipoint established its standard for reliable network coverage. He contended that mobile devices receive reliable signals below -84 dBm, but Omnipoint used that overly conservative figure primarily because its calculations were based on an outdated figure for receiver sensitivity and because it double-counted signal loss from a user's body. Maxson opined that Omnipoint could achieve reliable coverage using a lower signal standard. But he relied only on tests he had performed on Omnipoint networks in other areas. And Maxson never proposed an alternative figure for reliable coverage.

Maxson next said there were several alternatives to building a ninety-foot tower on church property, including placing

antennae on other utility poles around Phenix Avenue or another carrier's tower located in a West Warwick neighborhood Omnipoint employees had never heard of. He primarily opined that Omnipont should have considered building more than one facility to cover the Phenix Avenue gap. Maxson proposed three multisite solutions: building one smaller tower and a series of smaller facilities, called microcells, to supplement coverage; building a series of microcells; and building a distributed antenna system ("DAS"), in which fiberoptic cables connect a series of antennae mounted on utility poles.

Maxson gave vague details on the feasibility of these proposals, however. He did not reconcile his proposals with technology Omnipoint currently uses. On cross examination he acknowledged the DAS mode is not wireless--it requires cables--and no DAS systems existed in the Phenix Avenue area. He also did not explain how the microcell solutions would work with Omnipoint's current grid of towers or with the lower PCS signal. And Maxson conceded that he did not investigate whether other sites he suggested were available to Omnipoint or could even support the infrastructure he was envisioning. He identified only general locations to build facilities, such as "near the golf course," on "any of a number of those transmission line poles," and "on the other side of the ridge from Solid Rock Church." And Maxson

performed no testing to show whether these alternative designs actually would cover the gap around Phenix Avenue.

On October 23, 2008, the district court entered judgment for Omnipoint. City of Cranston II, No. 06-531, slip op. at 8. The court explained that Omnipoint had met its burden to show (1) that Cranston's zoning decision prevented Omnipoint from closing a "significant gap" in coverage and (2) that further reasonable efforts to find an alternative solution would be fruitless. Id. at 2, 8. The court rejected Maxson's testimony: "Taking into account Maxon's [sic] dearth of experience in designing wireless networks and his failure to conduct any testing before rendering his opinions," it found that Maxson's conclusions were "completely unreliable and unpersuasive." Id. at 7. The court then made two findings of fact:

1. There is a significant gap in Plaintiff's coverage area along Phenix Avenue in Cranston as mapped and tested by Luutu.
2. The only feasible site available to Plaintiff is the site at the Solid Rock Church where the construction of a 90 foot monopole will provide coverage in the gap area.

Id. Cranston timely appealed to this court, and we affirm.

III.

A. The Zoning Board Decision Was a "Final Action" under the TCA

Cranston makes a novel argument that the zoning board's decision is not a "final action" by a "State or local government" under § 332(c)(7)(B)(v) of the TCA.⁴ We review the district court's decision de novo because it is an issue of law, Daggett v. Comm'n on Governmental Ethics and Election Practices, 172 F.3d 104, 109 (1st Cir. 1999), and we affirm.

Section 332(c)(7) of the TCA, entitled "Preservation of local zoning authority," allows state and local governments to apply their zoning regulations to the construction of wireless facilities, subject to five substantive and procedural limitations.

⁴ Cranston frames this as a question of whether the federal court had "subject matter jurisdiction," which is a questionable articulation. See, e.g., Arbaugh v. Y & H Corp., 546 U.S. 500, 510 (2006) ("This Court, no less than other courts, has sometimes been profligate in its use of the term [jurisdiction]."); Eberhart v. United States, 546 U.S. 12, 15-16 (2005) (per curiam); Scarborough v. Principi, 541 U.S. 401, 413-14 (2004); Kontrick v. Ryan, 540 U.S. 443, 454-55 (2004) ("Clarity would be facilitated if courts and litigants used the label 'jurisdictional' not for claim-processing rules, but only for prescriptions delineating the classes of cases (subject-matter jurisdiction) and the persons (personal jurisdiction) falling within a court's adjudicatory authority."); Steel Co. v. Citizens for a Better Env't, 523 U.S. 83, 90-91 (1998).

The relevant section of the TCA, 47 U.S.C. § 332(c)(7)(B)(v), does not clearly state that the final action requirement is jurisdictional. Under Arbaugh, this is a highly relevant consideration. 546 U.S. at 514-16; accord Chao v. Hotel Oasis, Inc., 493 F.3d 26, 33 (1st Cir. 2007). Given our holding, however, we need not decide whether the issue is one of jurisdiction.

47 U.S.C. § 332(c)(7); see also Nat'l Tower, LLC v. Plainville Zoning Bd. of Appeals, 297 F.3d 14, 19-20 & n.3 (1st Cir. 2002) (listing these limitations). It creates a federal cause of action: "Any person adversely affected by any final action or failure to act by a State or local government or any instrumentality thereof that is inconsistent with" those five limitations may sue in state or federal court within thirty days to enforce the TCA's provisions. 47 U.S.C. § 332(c)(7)(B)(v).

Cranston implicitly concedes that zoning board decisions often would be final actions under the TCA. But it argues that a Rhode Island law permitting state court review of zoning board decisions creates an exception to that rule precisely because the statute limits the scope of court review and does not provide full court review of zoning board decisions.⁵ Cranston argues that such limited review makes state court proceedings part of a "comprehensive statutory scheme" for state zoning decisions that is not final until after state court review finishes. Omnipoint

⁵ Rhode Island has a separate statute governing state court review of zoning decisions. It provides, "An aggrieved party may appeal a decision of the zoning board of review to the superior court . . . within twenty (20) days after the decision has been recorded and posted." R.I. Gen. Laws § 45-24-69(a). Under Rhode Island law, a state court may reverse the zoning board only on six limited grounds and cannot "substitute its judgment for that of the zoning board of review as to the weight of the evidence on questions of fact." Id. § 45-24-69(d). Notably, this statute does not even mandate state court review. See id. § 45-24-69(a) (stating that parties "may" seek state court review of zoning board decisions).

rejoins that it did not need to sue in state court because the zoning board's decision was a final action by an instrumentality of a local government.

The TCA does not define "final action." The parties do not dispute the Cranston Zoning Board of Review is a "State or local government" or "any instrumentality thereof." See Black's Law Dictionary 764 (9th ed. 2009) (defining local government as "[t]he government of a particular locality, such as a city"); id. at 870 (defining "instrumentality" as "[a] means or agency through which a function of another entity is accomplished, such as a governing body").

When interpreting terms within the TCA, we consider its plain text and "design, structure, and purpose." Cablevision of Boston, Inc. v. Pub. Improvement Comm'n, 184 F.3d 88, 101 (1st Cir. 1999) (quoting O'Connell v. Shalala, 79 F.3d 170, 176 (1st Cir. 1996)) (internal quotation marks omitted). The Cranston Zoning Board of Review's decision falls within the usual meaning of final action set forth in the language of 47 U.S.C. § 332(c)(7)(B)(v). The terms "final" and "final action" have special meaning in the law, and we assume Congress knew the "content of background law" when legislating. In re Rivera Torres, 432 F.3d 20, 25 (1st Cir. 2005). Generally a decision is final if it is "concluded;" that is, if it does not "requir[e] any further judicial action by the court that rendered the judgment to determine the matter litigated"

and the decision can be appealed. Black's Law Dictionary 705 (9th ed. 2009).

The well-settled rule in administrative law is that a "final agency action" is one that "mark[s] the consummation of the agency's decisionmaking process." Whitman v. Am. Trucking Ass'ns, 531 U.S. 457, 478 (2001) (emphasis added) (quoting Bennett v. Spear, 520 U.S. 154, 177-78 (1997)) (internal quotation marks omitted). It means a "final determination" in a case by an administrative agency; that is, whether the agency "rendered its last word on the matter." Harrison v. PPG Indus., Inc., 446 U.S. 578, 586 (1980) (interpreting what is a "final action" by the Environmental Protection Agency under the Clean Air Act); accord Whitman, 531 U.S. at 478 (same). Only after an agency's final action may courts review the agency's decision. 5 U.S.C. § 704; Nat'l Ass'n of Home Builders v. Defenders of Wildlife, 551 U.S. 644, 659 (2007).

A "final action . . . by a . . . local government or any instrumentality thereof" must be one that marks the consummation of the instrumentality's decisionmaking process. In this case there is no dispute that the zoning board is a discrete "instrumentality" of Cranston, separate and distinct from the Rhode Island Superior Court. The parties agree Cranston's zoning board had concluded its decisionmaking process before that instrumentality and could take no further action. The zoning board's decision was final.

Sprint Spectrum L.P. v. City of Carmel, 361 F.3d 998 (7th Cir. 2007), on which Cranston relies, undercuts Cranston's argument and supports our analysis. The court held a carrier's claim was not ripe because the carrier sued in federal court when it still had further recourse before the local zoning board. Id. at 1004-05; accord Nextel Commc'ns of Mid-Atl., Inc. v. City of Margate, 305 F.3d 188, 193-94 (3d Cir. 2002). Indeed the Sprint Spectrum court observed that the carrier would not need to "exhaust[] all state judicial remedies before bringing suit in federal court." Id. at 1001 n.2.

Cranston's reading would frustrate the TCA's overall statutory scheme and purpose. The Act stresses the need for speedily deploying telecommunications and seeks to get prompt resolution of disputes under the Act. Congress enacted the TCA "to promote competition and reduce regulation in order to secure lower prices and higher quality services for American telecommunications consumers and encourage the rapid deployment of new telecommunications technologies." 110 Stat. at 56 (emphasis added). Under § 332(c)(7)(B)(v), parties may sue within thirty days of a final action, and courts must "hear and decide such action[s] on an expedited basis." To hold Omnipoint nevertheless needed to sue in state court would undermine the TCA's goals by imposing a new regulatory obstacle to providing consumers with wireless service.

To the extent § 332(c)(7)(B)(v), read in light of its language, context, and purpose, could be thought to be ambiguous, the legislative history confirms that a zoning board's decision is a final action and Omnipoint did not need to seek judicial review under state law of that board decision. The House Conference Report defined a final action as a "final administrative action at the State or local government level so that a party can commence action . . . rather than waiting for the exhaustion of any independent state court remedy otherwise required." Telecommunications Act of 1996, H.R. Rep. No. 104-458, at 209 (1996) (Conf. Rep.), as reprinted in 1996 U.S.C.C.A.N. 124, 223.

B. The District Court Did Not Err by Granting Judgment to Omnipoint after Trial

The district court found that Cranston had violated the TCA's provision that local zoning authorities may not "prohibit or have the effect of prohibiting the provision of personal wireless services." 47 U.S.C. § 332(c)(7)(B)(i)(II). In effective-prohibition cases we review whether the district court applied the proper legal standards de novo. Nat'l Tower, 297 F.3d at 22. The district court correctly cited the legal standards in this circuit. But whether, under the circumstances, an effective prohibition has occurred is a factual issue; we review how the district court resolved it for clear error. Id.; accord Omnipoint Commc'ns Enters., L.P. v. Zoning Hearing Bd. of Easton Twp., 331 F.3d 386, 392 (3d Cir. 2003) (on panel rehearing).

Beyond the statute's language, the TCA provides no guidance on what constitutes an effective prohibition, so courts, including this one, have added judicial gloss. E.g., T-Mobile USA v. City of Anacortes, 572 F.3d 987, 995-98 (9th Cir. 2009); VoiceStream Minneapolis, Inc. v. St. Croix County, 342 F.3d 818, 833, 834-35 (7th Cir. 2003); Second Generation Props., LP v. Town of Pelham, 313 F.3d 620, 631-35 (1st Cir. 2002); Sprint Spectrum L.P. v. Willoth, 176 F.3d 630, 643 (2d Cir. 1999); APT Pittsburgh Ltd. P'ship v. Penn Twp. Butler County, 196 F.3d 469, 480 (3d Cir. 1999); Town of Amherst v. Omnipoint Comm'cns Enters., Inc., 173 F.3d 9, 14-15 (1st Cir. 1999); see also Willoth, 176 F.3d at 641 (noting, when interpreting this provision, that it "would be [a] gross understatement to say that the Telecommunications Act of 1996 is not a model of clarity." (quoting AT & T Corp. v. Iowa Utils. Bd., 525 U.S. 366, 397 (1999)) (alteration in original)).

The carrier has the burden to show an effective prohibition has occurred. City of Anacortes, 572 F.3d at 995; USCOC of Greater Iowa, Inc. v. Zoning Bd. of Adjustment, 465 F.3d 817, 825 (8th Cir. 2006); St. Croix County, 342 F.3d at 833, 835; USCOC of Va. RSA #3 v. Montgomery County Bd. of Supervisors, 343 F.3d 262, 268 (4th Cir. 2003); Second Generation Props., 313 F.3d at 629; Easton Twp., 331 F.3d at 397. When a carrier claims an individual denial is an effective prohibition, virtually all circuits require courts to (1) find a "significant gap" in coverage

exists in an area and (2) consider whether alternatives to the carrier's proposed solution to that gap mean that there is no effective prohibition.⁶ MetroPCS v. City and County of San Francisco, 400 F.3d 715, 731 (9th Cir. 2005); see, e.g., Second Generation Props., 313 F.3d at 631, 635. Circuits disagree, however, in the language they use to measure when a significant gap exists and about the inquiry into alternative solutions.

Courts do agree that both of these determinations are fact-bound. Second Generation Props., 313 F.3d at 631 ("The question whether an individual denial is an effective prohibition is largely fact-driven."); accord 360 Degrees Commc'ns, 211 F.3d at 87 (describing these cases as requiring "essentially a fact-bound inquiry"); see also Penn Twp., 196 F.3d at 480 (explaining courts may consider, "e.g., [if] the provider has considered less sensitive sites, alternative system designs, alternative tower designs, placement of antennae on existing structures, etc."); MetroPCS, 400 F.3d at 733 (calling the significant-gap test an "extremely fact-specific" inquiry that "def[ies] any bright-line legal rule").

⁶ The Fourth Circuit has rejected any standard beyond the language in the statute. 360 Degrees Commc'ns Co. of Charlottesville v. Bd. of Supervisors, 211 F.3d 79, 87 (2000). But it has applied a version of this test in at least one case. See id. at 87-88 (assuming a "significant gap[]" existed and holding that the carrier failed to show no alternatives were feasible).

Courts ultimately decide these cases based, not on bright-line legal standards, but on the facts in the record. See, e.g., City of Anacortes, 572 F.3d at 998-99; Second Generation Props., 313 F.3d at 635; USCOC of Va. RSA #3, 343 F.3d at 268-69; St. Croix County, 342 F.3d at 836; Willoth, 176 F.3d at 643-44; Town of Amherst, 173 F.3d at 14.

1. Existence of a Significant Gap in Coverage

Through the significant-gap analysis courts "determine whether a coverage problem exists at all." Second Generation Props., 313 F.3d at 631. In this circuit we consider whether a significant gap in coverage exists within the individual carrier's network. Metheny v. Becker, 352 F.3d 458, 461 & n.2 (1st Cir. 2003); Second Generation Props., 313 F.3d at 632-35. We have rejected the Third Circuit's rule that considers not the individual carrier's network but whether any carrier provides service to an area. Cf. Nextel W. Corp. v. Unity Twp., 282 F.3d 257, 265 (3d Cir. 2002). In our view, the Third Circuit rule prevents customers in an area from having a choice of reliable carriers and thus undermines the TCA's goal to improve wireless service for customers through industry competition. Second Generation Props., 313 F.3d at 631, 633. The Ninth Circuit has adopted our approach. MetroPCS, 400 F.3d at 731-33.

When relevant, courts assessing whether a coverage gap is significant should consider, inter alia, the physical size of the

gap, the area in which there is a gap, the number of users the gap affects, and whether all of the carrier's users in that area are similarly affected by the gaps. See, e.g., Second Generation Props., 313 F.3d at 631; see also MetroPCS, 400 F.3d at 733 & n.10; 360 Degrees Commc'ns, 211 F.3d at 87; Cellular Tel. Co. v. Zoning Bd. of Adjustment of the Borough of Ho-Ho-Kus, 197 F.3d 64, 70 n.2 (3d Cir. 1999); Willoth, 176 F.3d at 643-44. Also relevant could be data about percentages of unsuccessful calls or inadequate service during calls in the gap area. Here, Omnipoint had shown its need for coverage around Phenix Avenue is significant. It established Phenix Avenue was a heavily traveled and important route that connects Cranston to its neighbors.

Cranston argues that the district court measured the quality of coverage around Phenix Avenue with an improper--and unfair--yardstick because the court accepted Omnipoint's -84 dBm standard for reliable service, which Omnipoint had set to satisfy customers. Cranston asks us to rule that a trial judge errs in considering the provider's defined level of acceptable service on the question of the existence of a significant gap. We reject such bright-line rules. See MetroPCS, 400 F.3d at 733. In this case, the district court's finding that there was a significant gap in coverage was quite reasonable, and not clear error, on the evidence.

The court did not err by accepting the testimony of Omnipoint's expert, Elijah Luutu, about a coverage gap around Phenix Avenue in Cranston, which we described earlier. At trial and on appeal Cranston has argued that Omnipoint did not meet its burden because Luutu's testimony was based on the premise that signal levels below -84 dBm constitute a gap in coverage. But the record contains no evidence that undercuts that premise, and the premise was reasonable on its face.

Contrary to Cranston's argument, the district court did not adopt -84 dBm as a legal standard for whether a coverage gap exists, and neither do we. The only evidence Cranston presented to contest Luutu's testimony were Maxson's opinions that Omnipoint's methodology for calculating and testing coverage gaps was flawed and its standard for coverage was wrong. But the district court noted that, unlike Luutu, Maxson lacked experience designing wireless systems and his opinions were "not based on any actual measurements or tests he conducted at the site." City of Cranston II, No. 06-531, slip op. at 7. It thus found Maxson's "conclusions completely unreliable and unpersuasive." Id.

As the factfinder, it was the district court's responsibility to determine how much weight to give each expert's testimony. Bruce v. Weekly World News, Inc., 310 F.3d 25, 30 (1st Cir. 2002) ("[T]he district court, qua factfinder, was entitled to make the crucial credibility determination as between the competing

expert witnesses."); cf. Seahorse Marine Supplies, Inc. v. P.R. Sun Oil Co., 295 F.3d 68, 81 (1st Cir. 2002) ("The [expert's] ultimate credibility determination and the testimony's accorded weight are in the jury's province."). The district court chose to discount Maxson's testimony based on the quality of his experience and supporting evidence, and we will not disturb its assessment.⁷ Cf. Ferrara & DiMercurio v. St. Paul Mercury Ins. Co., 240 F.3d 1, 9 (1st Cir. 2001) ("When the factual underpinning of an expert opinion is weak, it is a matter affecting the weight and credibility of the testimony--a question to be resolved by the jury." (quoting Newell P.R., Ltd. v. Rubbermaid Inc., 20 F.3d 15, 21 (1st Cir. 1994) (internal quotation marks omitted))).

2. Alternative Solutions

Once a court has found a coverage gap exists, it must determine whether local authorities have prevented a carrier from closing that gap so as to amount to an effective prohibition. See Second Generation Props., 313 F.3d at 635 (noting even if a gap is found to exist carriers "must still show that there are no alternative sites which would solve the problem"). Two articulations have emerged in the circuits for the second prong of effective-prohibition claims. This court and the Seventh Circuit

⁷ Contrary to Cranston's argument, the district court did not shift the burden of proof to it. The court merely assessed Maxson's persuasiveness as an expert based on the quality of support he provided for his opinions.

have used the language of the "only feasible plan." St. Croix, 342 F.3d 835; Second Generation Props., 313 F.3d at 630; Town of Amherst, 173 F.3d at 14. The Second, Third, and Ninth Circuits have articulated the question as whether the proposed solution is the least-intrusive means. City of Anacortes, 572 F.3d at 995; Nextel W. Corp., 282 F.3d at 266; Willloth, 176 F.3d at 643. The Fourth Circuit has held courts should simply apply the language of § 332(c)(7)(B)(i)(II) to the facts of a case. 360 Degrees Commc'ns, 211 F.3d at 87. Nevertheless, in 360 Degrees Communications, the court quoted our standard from Town of Amherst to reject one carrier's claim. Id. at 88.

It is unclear how much these different articulations of the tests truly differ. This court's opinion in Town of Amherst first used the language of "only feasible plan." In that case we held that a carrier could claim a single zoning decision effectively prohibited it from providing wireless service. Town of Amherst, 173 F.3d at 14. But the carrier had the "heavy" burden "to show from the language and circumstances not just that this application has been rejected but that further reasonable efforts [to find another solution] are so likely to be fruitless that it is a waste of time even to try." Id. To prevail, the carrier could not insist on one, ideal way to provide service; the TCA required it to consider alternatives more palatable to local zoning authorities. Id. at 14-15. "Were [its] existing proposal the only

feasible plan," we noted, "then prohibiting its plan might amount to prohibiting personal wireless service."⁸ Id.

The underlying question is whether, under the facts of a case, a zoning decision effectively prohibited providing wireless service. See 47 U.S.C. § 332(c)(7)(B)(i)(II); Second Generation Props., 313 F.3d at 630 ("[T]here can be no general rule classifying whether there is an effective prohibition. It is a case-by-case determination."); see also 360 Degrees Commc'ns, 211 F.3d at 87 (refusing to adopt one analytic approach for such claims because doing so would "unduly limit[] what is essentially a fact-bound inquiry"). When evaluating such claims "we are in the realm of trade-offs" between the carrier's desire to efficiently provide

⁸ Courts since have built on this decision. Citing Town of Amherst, the Second Circuit held that local authorities cannot reject a carrier's plan that offers "the least intrusive means for closing a significant gap." Willloth, 176 F.3d at 643. The court listed "numerous ways [carriers could] limit the aesthetic impact of a cell site" without sacrificing coverage. Id. The Third and Ninth Circuits followed Willloth, holding carriers must prove their solution is "the least intrusive on the values that the denial sought to serve." Penn Twp., 196 F.3d at 480; MetroPCS, 400 F.3d at 734-35 (internal quotation marks omitted). The provider must prove it made "a good faith effort" to "identify and evaluate less intrusive alternatives." Penn Twp., 196 F.3d at 480. The Seventh Circuit rejected the least-intrusive-means test, opining it undermined local autonomy and strayed from the statutory text, and it instead adopted our feasible-alternative analysis. St. Croix County, 342 F.3d at 834-35 & n.8 (citing 360 Degrees Commc'ns, 211 F.3d at 87). The Seventh Circuit then applied the Town of Amherst test to hold there was no effective prohibition when a carrier produced no evidence it considered alternatives. Id. at 834-36. The Ninth Circuit, however, adopted the least-intrusive-means test because it thought the "only feasible plan" test was "too exacting." MetroPCS, 400 F.3d at 734.

quality service to customers and local governments' primary authority to regulate land use. Town of Amherst, 173 F.3d at 15. A carrier "may think . . . its solution is best," but, "subject to an outer limit, such choices are just what Congress reserved to the town" in § 332(c)(7). Id.

The effective prohibition clause does not stand alone; it is also part of the TCA's larger goal of encouraging competition to provide consumers with cheaper, higher-quality wireless technology. See id. at 13. As cell phone use increases, carriers need to build more facilities, especially in populated areas, to continue providing reliable coverage, and local regulations can present serious obstacles.⁹ See Sw. Bell Mobile Sys., Inc. v. Todd, 244 F.3d 51, 57 (1st Cir. 2001) ("[A]s Congress found, 'siting and zoning decisions by non-federal units of government [] have created an inconsistent and, at times, conflicting patchwork of requirements which will inhibit the deployment of [wireless

⁹ Local authorities face what commentators call the "not in my backyard" ("NIMBY") problem: property owners resist new facilities in populated areas because they find wireless facilities unsightly and worry facilities lower property values; yet as cell phone consumers these same people want quality service where they are most. E.g., D. Hughes, When NIMBYs Attack: The Heights to Which Communities Will Climb to Prevent the Siting of Wireless Towers, 23 J. Corp. L. 469, 482-83 (1998); S. Eagle, Wireless Telecommunications, Infrastructure Security, and the NIMBY Problem, 54 Cath. U. L. Rev. 445, 455-57 (2005). Residents often pressure town authorities to tighten and strictly enforce zoning restrictions on wireless facilities, creating numerous pockets of resistance for wireless carriers. Hughes, supra, at 470-71, 482-84.

technology]" (quoting Omnipoint Corp. v. Zoning Hearing Bd. of Pine Grove Twp., 181 F.3d 403, 407 (3d Cir. 1999) (second alteration in original)); J. Berger, Efficient Wireless Tower Siting: An Alternative to Section 332(c)(7) of the Telecommunications Act of 1996, 23 Temp. Envtl. L. & Tech. J. 83, 88 (2004). The themes in the TCA of promoting competition in the wireless communications market and of relatively speedily effectuating the purpose of the Act, including the elimination of significant gaps, underlie the determination of feasibility and impose their own constraints. Just as carriers must present evidence of their efforts to locate alternative sites, once they have done so there are limits on town zoning boards' ability to insist that carriers keep searching regardless of prior efforts to find locations or costs and resources spent.

Any feasibility analysis balances these competing interests. Nat'l Tower, 297 F.3d at 20. A carrier cannot win an effective-prohibition claim merely because local authorities have rejected the carrier's preferred solution. Second Generation Props., 313 F.3d at 635; Town of Amherst, 173 F.3d at 14-15; accord St. Croix County, 342 F.3d at 834-35. On the other hand, if local authorities reject a proposal that is "the only feasible plan," that denial could "amount to prohibiting personal wireless service." Town of Amherst, 173 F.3d at 14. The burden is on the carrier to prove it "investigated thoroughly the possibility of

other viable alternatives" before concluding no other feasible plan was available. St. Croix County, 342 F.3d at 834-35.

When we have held the carrier has not met its burden, the evidence has been essentially undisputed that the carrier had other alternatives. In Town of Amherst, the carrier "did not present serious alternatives to the town" other than the most efficient solution, a network of four 190-foot towers, one located in a historic district. 173 F.3d at 11, 15. The town, although willing to allow wireless facilities, opposed the towers' height and some locations. Id. at 14. We held the carrier did not show it was entitled to summary judgment because it "practically admitted that somewhat lower towers were technically feasible" and it was unclear "that locating a tower within the historic district was technically essential." Id. at 15. Similarly, in Second Generation Properties, the carrier presented no explanation why its proposal was the only feasible site. 313 F.3d at 635. Indeed, the carrier's "own experts acknowledged that its land was not the only location where a tower could provide coverage in the alleged gap." Id. We noted the TCA gives local authorities an opportunity to consider any feasible alternatives before courts launch "the heavy artillery of federal preemption." Id. The Seventh Circuit, in St. Croix, also found a carrier had not met its burden because it presented no evidence it investigated alternative solutions other than conclusory statements. 342 F.3d at 835-36.

Whether the carrier proves an effective prohibition has occurred is a factual question for the trial court to resolve. See Second Generation Props., 313 F.3d at 631 (explaining effective-prohibition claims are "largely fact-driven"). As with most such questions, the district court may consider a number of facts relevant to the conclusion it must reach. What facts are relevant may vary with the case. It is clear that the technical feasibility of the proposed solution or alternative solutions is important. See Town of Amherst, 173 F.3d at 15. Town of Amherst does not say that technical feasibility is the only criterion, nor would we adopt such a rule. The fact that a carrier's proposed solution to the gap is technologically optimal does not, under Town of Amherst, end the inquiry. Nor does the inquiry end with the solution preferred by town officials other than the zoning board.

Town of Amherst discussed, inter alia, the "overall cost" to the carrier, whether the solution was technically efficient, whether other technically adequate solutions were in evidence, whether the town could prefer other solutions on aesthetic grounds, and whether local authorities were willing to cooperate with carriers. See id. at 14-17; see also Second Generation Props., 313 F.3d at 635 ("Nothing in the Town's actions thus far shows an unwillingness to acknowledge a problem or permit the crafting of a solution."). Ultimately the question is a practical inquiry into feasible, available alternatives. See, e.g., City of Anacortes,

572 F.3d at 997-98 (considering the availability of proposed alternatives).

In Town of Amherst the carrier's rigid insistence on its optimal plan proved fatal. By contrast, in this case, Omnipoint presented evidence its final plan, which was plainly not its optimal plan, was the only feasible one. In light of evidence of Omnipoint's efforts to "investigate[] thoroughly the possibility of other viable alternatives," St. Croix County, 342 F.3d at 834-35, the district court did not clearly err in finding that constructing a new tower at the Solid Rock Church site was the only feasible way to close the Phenix Avenue coverage gap.

The evidence described earlier showed that Omnipoint had in fact systematically searched for solutions to the gap problem using technologically reliable criteria and methodologies. Omnipoint considered different types of solutions: adding to existing wireless towers; adding to existing structures of the needed height, including utility poles; and new construction of facilities on unoccupied land. Further, Omnipoint showed it had made financial offers according to its usual rates, increased its rates, and then offered an extraordinary bonus in an effort to reach a contract with the country club but was unsuccessful. After Luutu designed the search ring, it took Omnipoint two years to work through the various options, reach an agreement with the church,

and apply for a variance. There was no meaningful contrary evidence.

The trial court could permissibly conclude that Cranston's proposed alternatives rebutting this evidence were not feasible. Cranston suggests that Omnipoint was required to go back to the country club a fourth time to try to make a deal by, presumably, sweetening the pot further than it had before when it increased its usual rate and added a bonus payment. That is pure speculation. Cranston offered no evidence that the divided owners of the country club would have agreed, particularly as they had previously rejected any digging up of the fairway, which most of the proposals entailed. Nor did Cranston offer any evidence that Omnipoint had been commercially unreasonable. Omnipoint does not argue, and this case does not turn on, a claim by a carrier that economic infeasibility alone makes an alternative site unavailable.

The court, having found Maxson's testimony neither supported by fact nor by experience, was warranted in rejecting his view that Omnipoint should have adopted an alternative technology that the company did not use or, in the case of the fire department museum, that provided largely repetitive coverage with another tower to solve the gap. On this evidence, the district court did not err by finding the Solid Rock Church site was Omnipoint's only feasible option.

Affirmed.