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The Monroeville Doctrine

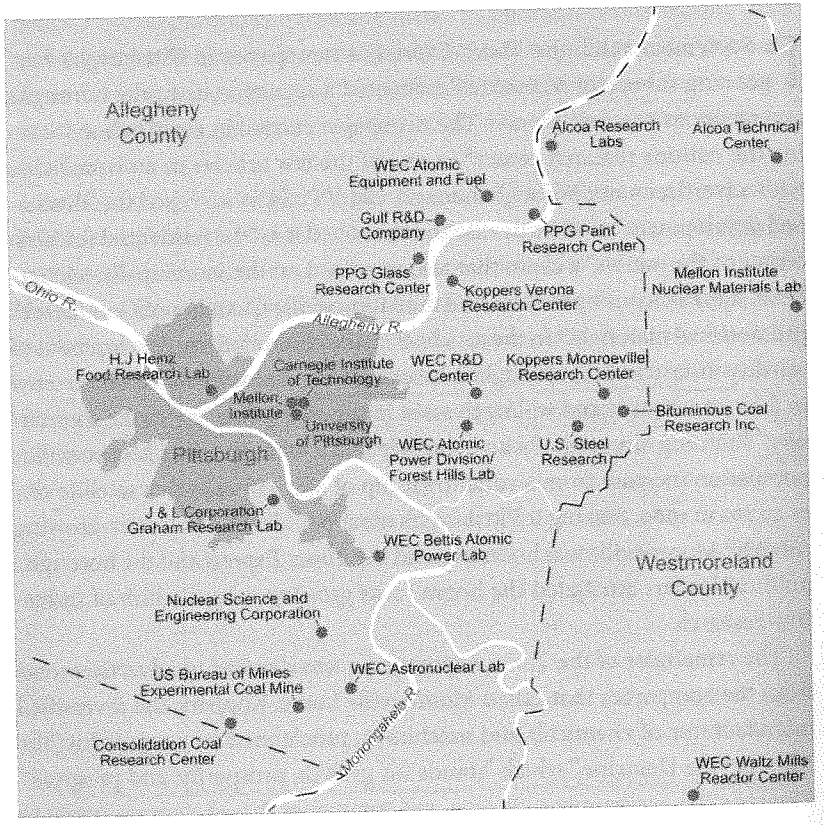
How the Suburbs Shaped Cold War Science

In September 1969, the *Times Express,* a newspaper in Pittsburgh's burgeoning suburb of Monroeville, devoted a special issue to the borough's emergence as a research center. The newspaper carried its usual byline, "Serving the nation's research center." In one of the few articles in an issue laden with advertisements, borough manager Carol Pickens surveyed the "diversified development" of Monroeville and described it as "the residential research center of the nation," a claim that also appeared on the municipality's letterhead, signs welcoming visitors, and the Monroeville Chamber of Commerce's promotional materials.[1] In the article, Pickens celebrated the development of "quality industries" that brought a special class of "people who are interested in their community and willing to assist in the efforts to improve the community." Running alongside Pickens's article was a table showing Monroeville's population increase from a rural township of 4,675 in 1940 to a satellite city of 27,701 in 1969, making it Pittsburgh's most populated and fastest-growing suburb.[2] Monroeville was booming, and the *Times Express* and the borough's political leaders attributed the boom to its growing role as a hub of industrial research.

The remainder of the *Times Express* issue was devoted to advertisements from the companies that called Monroeville home. Koppers, the diversified manufacturer of chemicals and machinery, proclaimed its support for "the Monroeville Doctrine," which "stands for growth, prosperity, and progress." Monroeville's government, citizens, and companies shared a commitment to "community advancement," and this was why it had located its research laboratories there in 1961. U.S. Steel's advertisement for its research center, the

first developed in Monroeville in 1953, described researchers who developed more than "a beam of high speed electrons." Off the job, U.S. Steel's employees were "busy with civic projects" and serving in local government. The capstone of the special issue was a full-page ad showing a model of the new Westinghouse Energy Center that was scheduled to open in 1970 and would make Monroeville the "NUCLEAR CAPITOL OF THE WORLD." The ad invited residents to visit a temporary Westinghouse display at the Monroeville Mall, where they could learn more about nuclear power and the new energy center.[3]

At first glance, visitors to "the nation's research center" would have seen an unremarkable commercial artery lined with strip malls. However, traveling beyond congested Route 22 into the surrounding hills, they would have



Map 3. Major research facilities in Pittsburgh in 1962. Map based on Lowry, *Portrait of a Region*, 97.

found the research facilities of Pittsburgh's leading industrial firms. Throughout the 1950s and 1960s, numerous companies and private developers created research centers and office buildings in Monroeville and other nearby suburbs. Counts vary, but by 1960 the Pittsburgh region was home to at least forty-one major research facilities and many smaller laboratories. Of these forty-one major facilities, twenty had been built since 1945 and most were located in the suburbs (see Map 3).[4]

During the postwar period, Pittsburgh's eastern suburbs became a location of choice for industrial research laboratories and office complexes that housed engineering services. The growth of research and engineering in Monroeville and other suburbs was facilitated by a number of major changes, including the construction of the Penn Lincoln Parkway in 1953 and its extension to the borough several years later, the availability of inexpensive and flat land, federal tax incentives, and increasing government and private support for industrial research. Industrial firms also pursued the Monroeville Doctrine because they thought suburban space was conducive to research. The Monroeville Doctrine was driven by firms' efforts to build exclusive suburban spaces for science that would help reproduce a technoscientific workforce, open new markets, and capture state funds, which would in turn create new business opportunities. While the Pittsburgh Renaissance ensured that the region and its firms benefited from government spending on urban renewal, its suburban counterpart, the Monroeville Doctrine, attempted to secure their share of federal funds allocated for research and defense.

I begin this chapter with a general discussion of why Pittsburgh firms pursued the Monroeville Doctrine during the Cold War. I then turn to a case study of the move by the Westinghouse Research Laboratories from Forest Hills to Churchill. I use this example to explore how research laboratories and suburban communities built a mutually beneficial relationship based on social exclusion, status, and control. This mutually beneficial relationship was premised on an idealized understanding of research as an exceptional form of mental labor that was radically different from other forms of labor in general and the corporal work of manufacturing in particular. In developing this mutually beneficial relationship, exclusive suburbs and industrial firms enshrined an untenable idea of research that helped maintain racial, class, and gender exclusion in both subdivisions and laboratories. According to local politicians and residents, the only suitable form of employment in residential suburbs was that of highly educated scientists and engineers. In

turn, industrial firms agreed to maintain the illusion that research was radically different from other forms of labor in order to access exclusive suburbs that were key to attracting scientists and engineers and defense contracts. During the early Cold War, in the Pittsburgh region and across the United States, industrial research and affluent suburban communities were remade in each other's exclusive image.[5]

The Suburbanization of Research in Postwar Pittsburgh

As in Boston, New York, and many other regions, research centers in Pittsburgh rapidly multiplied and suburbanized in the years following World War II. For corporate executives, modern laboratories presented the cutting-edge character of their firms. For the communities that housed laboratories, they became points of pride. For the region's elite, the expansion of research and development furthered their argument that Pittsburgh was transcending its industrial past.[6] While the image of these pristine suburban labs suggested that they were places of isolated scientific pursuit, in fact they had immediate effects on industrial production, urban development, and local property markets and were an attempt to capture federal spending on defense and research. The typical suburban research lab in Pittsburgh presented an image of scientific autonomy, but the reality was very different.

In 1963 *Region in Transition,* the first volume of the three-volume Ford Foundation–funded *Economic Study of the Pittsburgh Region* (*ESPR*), was released. The study, first proposed in 1958 by the Regional Industrial Development Corporation (RIDC) and the Pittsburgh Regional Planning Association (PRPA), was intended to establish hard facts about Pittsburgh's moribund growth.[7] It was also meant to contribute scientific analysis to the Pittsburgh Renaissance and to serve as a model for the emerging field of regional economic analysis.[8] While the study lamented the region's ominous economic outlook and reliance on the basic metals industry, it also celebrated the presence of industrial research and corporate headquarters in the Pittsburgh region.[9] According to the *ESPR,* only Wilmington, Delaware (12.2 percent) and Detroit (6.9 percent) exceeded Pittsburgh (6.0 percent) in the percentage of its workforce employed in administrative and auxiliary functions. In absolute numbers, Pittsburgh ranked fourth in the United States behind New York City, Detroit, and Chicago. Unsurprisingly, the majority of those employed in these fields in Pittsburgh worked in metals industries, with

32.5 percent in basic metals and 24.6 percent in fabricated metal products, followed by 17.7 percent in electrical equipment and 9.0 percent in petroleum and coal products.[10] In 1960 private research and development employed 13,300, representing an annual growth of 6.5 percent over the previous five years. The third volume of the *ESPR* optimistically projected that by 1985 the region would be home to 51,931 people employed in industrial research and development.[11] Much of that growth, it predicted, would be at Westinghouse.

In a region where there was little hope for economic optimism, the authors of *Region in Transition* highlighted how Pittsburgh's significant concentration of corporate headquarters and research laboratories boded well "in an age when more and more of Man's work involves brain rather than brawn."[12] *Region in Transition* furthered the influential perspective, described in detail in chapter 2, that Pittsburgh's elite must create appealing workplaces, communities, and amenities for scientists, engineers, and other white-collar professionals in order to advance the region's growth. As the *ESPR* described, "a flourishing 'research community'" would "stimulate industrial and other employment," and this "is particularly valuable for a region, like the Pittsburgh Region, which needs a foothold in new growth industries if it is to enjoy even minimal economic growth."[13] While the study projected continued expansion of research and development, it lamented Pittsburgh's lack of specialization in aerospace and electronics, the most promising fields for growth.[14]

Within the region, industrial research was "characteristically suburban."[15] Based on their interviews with local executives and research lab directors, the authors of the *ESPR* outlined several reasons why industrial research facilities exhibited a "virtually unanimous preference . . . for suburban locations." One reason was a deep concern for projecting an innovative image to potential employees and customers. Based on his conversations with research directors, Ira Lowry, the author of the second volume of the *ESPR,* observed that "nearly all respondents stressed the importance of visual appeal" of their research centers. To the research directors, a properly designed research center with "a campus atmosphere helps their recruitment program" and "serve[s] as symbols of progressive management." This "visual appeal" was intended not only to appeal to employees but also to "impress the company's customers and the general public." According to Lowry, the appropriate design of such a research center "call[s] for low sprawling buildings, landscaped grounds, and extensive parking lots."[16]

Firms did not locate their labs based on image alone. Most shared "a vague optimism about future expansion" and projected growth of research for the foreseeable future.[17] Suburban land was less expensive and constrained than land in built-up areas and allowed firms to purchase parcels suitable for expansion. Profit-savvy industrial firms located their research centers in the suburbs with an eye toward growth but also with awareness that suburban land was a good investment that they could always recoup by developing adjacent land.

Many of the research directors Lowry spoke with believed that "isolation" was "advantageous." Like the research directors of the first Westinghouse Research Lab in Forest Hills, they thought that researchers needed to be buffered from the immediate demands of the factory while still remaining in touch with manufacturing divisions. They similarly emphasized that a quasi-isolated location kept staff from becoming "overly involved in production problems at the expense of investigations of longer range." Not only was suburban isolation important for protecting the supposed autonomy of researchers, but the presence of a nearby production site would harm the "visual appeal" of the research center. As Lowry described, "untidy production facilities tend to dominate the environment, damaging the valued image of the research center."[18]

By the early twentieth century, the eastern suburbs of Pittsburgh developed as one of the preferred residential locations for the city's white-collar workforce. By the 1930s, this region, along with the adjacent city neighborhoods of Point Breeze, Shadyside, and Squirrel Hill, contained the residential areas of choice for doctors and academics employed in Oakland as well as engineers, scientists, and managers employed at firms such as Westinghouse. In the 1950s, when firms began to develop plans for new laboratories, they accounted for the current residences of researchers, many of whom could easily find employment elsewhere. As a result, laboratories tended to move even further into the suburbs, where many of their employees already lived.

The authors of the *ESPR* noted that "several respondents mentioned specifically that management had been concerned about the effect of a move on the work force." As a result, before locating a lab, each firm "first investigated the geographical distribution of the residences of the research and auxiliary staff." As firms chose to locate their laboratories in proximity to the suburban neighborhoods where engineers and scientists had always lived, property developers saw the opportunity to develop similar subdivisions. "A move into virgin territory will soon be followed by residential subdividers eager to serve this high-income market," the authors of the *ESPR* observed, and "the development of Churchill and Monroeville as residential communities has been fostered by the cluster of research activities in that area."[19] Firms often promoted the suburbs that surrounded their laboratories to potential and current employees (see chapters 2 and 5).

During the Cold War, research labs may have grown increasingly distant (geographically at least) from manufacturing facilities, but they maintained a close connection to corporate headquarters. The growth of research centers in Pittsburgh's eastern suburbs was facilitated by the construction of the Penn Lincoln Parkway (later known as Parkway East), which provided relatively quick access to downtown Pittsburgh and Oakland. In addition, many firms added little-used helicopter-landing pads in their lab's designs. Such infrastructure fulfilled firms' fanciful modern dreams of researchers and executives whisking from suburban labs to downtown Pittsburgh and the airport.[20]

Research labs clustered in an arc to the east and south of Pittsburgh (see Map 3). This area afforded easy access to the universities and cultural amenities of Oakland as well as to the ring of suburbs that housed Oakland-based professors, doctors, and researchers. With local research and development dominated by large firms, collaboration between laboratories and the creation of spinoff companies was exceedingly rare (disappointingly to the authors of the *ESPR*). In a few cases, labs were intentionally sited in proximity to each other. For example, Westinghouse's research facilities clustered in the eastern and southern suburbs in order to allow easy movement between them. In most instances, though, what research centers shared was their parent firm's faith in the Monroeville Doctrine—that the suburbs offered the most suitable and economical location for industrial research.

The suburbs offered an additional advantage that was unnoticed by the *ESPR*. While it is true that suburban land offered greater flexibility than built-up locations, it also provided compliant local governments that rarely opposed new research facilities. In the 1950s and 1960s, suburban governments were particularly welcoming, especially Monroeville, which prided itself on being a "research capital," and Churchill, whose tax base was dominated by Westinghouse. Growth-friendly municipalities rolled out the red carpet for research laboratories that brought esteemed residents and taxpayers, with few of the side effects of manufacturing. Needless to say, the presence of both significant land developers and the employees of firms on the councils of

those municipalities limited the possibility for conflict to emerge. Following a strategy they had pursued since the 1880s, industrial firms sought out and created favorable political and economic conditions in the suburbs.

While these factors all played a role in the growth of research laboratories in Pittsburgh's suburbs, another essential factor was the expansion of state spending on research and defense and favorable federal tax policies. Most local firms developed labs in the hope of netting a share of the Pentagon's largess. Thus the growth in research facilities in Pittsburgh's suburbs during the 1950s corresponded to the massive increase in defense spending that began during the Korean War.

Several federal tax incentives also made it advantageous to develop new research facilities in the suburbs. The Armed Services Procurement Act of 1947 gave the federal government the power to use procurement procedures to encourage industrial dispersal.[21] In October 1950, the Harry S. Truman administration amended the federal tax code to grant facilities given a "certificate of necessity" (attesting that they did defense work) full and accelerated amortization of their new facilities. Geographical dispersal was one basis on which the federal government awarded this new tax status. In 1951 the Truman administration encouraged all federal agencies to adopt measures to encourage firms to locate facilities outside critical defense areas. The most significant federal incentive for industrial dispersal occurred in 1954, when the Department of Commerce adopted a tax policy that granted firms accelerated amortization for *all new* facilities regardless of their location. This broad tax subsidy to new construction, along with federal highway spending, encouraged firms to construct new suburban facilities in Pittsburgh and elsewhere. While generous federal tax write-offs did not ensure decentralization, their combination with high taxes on profits meant that new suburban facilities were often highly affordable investments for businesses.[22] When coupled with subsidies and tax deductions for white suburban homeowners, they accelerated the rush of laboratories and scientists to the suburbs.[23]

A combination of factors contributed to firms' decisions to construct research labs in Pittsburgh's suburbs. Firms moved to the suburbs because they created conditions that would attract and reproduce technoscientific workers, earn public renown, and in doing so, it was hoped, discover new profitable areas of business and attract government-funded research. Despite the complexity of their decision to locate in the suburbs, firms always intended

that laboratories pursue three primary goals: the reproduction of a scientific workforce, the opening of new markets, and the capture of federal spending.

Locating the Westinghouse Research Laboratories

In 1956 Westinghouse moved its Research Laboratories from Forest Hills to Churchill.[24] It was one of the largest research centers in the region and at its peak employed more than 2,200 staff.[25] It also had the greatest diversity of researchers (at one point ranging from metallurgists to sociologists), the strongest focus on basic research, and the closest ties to the military. Prominently located along the Penn-Lincoln Parkway, it was also the most visible laboratory in the region. The labs' high visibility and modern design were part of Westinghouse's larger effort in the 1950s to rebrand itself as a firm where scientific innovation was an essential part of business. If the Westinghouse Research Laboratories are any indication, then industry's emphasis on building suburban labs was primarily driven by the prosaic need to retain and reproduce technoscientific workers, invest ballooning profits, earn lucrative tax write-offs, allow for easy expansion, and ensure that the laboratory fit into exclusive suburbs. These factors, as much as the need to develop an ideal place to accommodate research, dictated the design and location of labs.

In 1949, flush with increasing profits from the Korean War and postwar economic growth, Westinghouse's new research director, electrical engineer John A. Hutcheson, began to advocate for a new laboratory. The reasons were simple: the research needs of the company were growing, while the current laboratory could not serve an expanded workforce. The site of the Forest Hills laboratory was bounded on three sides by housing and on a fourth by a steep slope. The company had built additions to the lab many times and had even moved research to off-site buildings, including a nearby shopping plaza and garage. Hutcheson warned that "no significant increase in personnel can be accommodated" at the Forest Hills site. Westinghouse was also entering "new fields of endeavor," particularly electronics, and such fields required increased research. Hutcheson emphasized that "international tensions" were expanding military research that Westinghouse could not accommodate at the current site.[26] If Westinghouse hoped to capture these growing fields, it needed to expand both its workforce and the facilities that housed it.[27] Building such a facility would be affordable because of expanded

defense work, "the possibility of short term amortization of a sizeable fraction" of the cost, and "relatively high taxes" on corporate profits.[28]

Convinced by Hutcheson's argument, Westinghouse began to scour Pittsburgh's suburbs for an appropriate site. In a June 29, 1951, letter, Hutcheson listed the key attributes. The parcel of land should be at least fifty acres and flat, in order to keep down expenses. The surrounding land should be "residential rather than industrial" and preferably would allow for additional home construction in the vicinity. It would need to be located "as close to the present site as possible" and no more than thirty minutes from Forest Hills.[29] Throughout the search process, Hutcheson stressed the need for the new lab to be proximate to Forest Hills in order to avoid a "loss of time and personnel." He was especially concerned about the lab's clerical and skilled technical workforce, who he believed lived mostly in Turtle Creek Valley and would be unable to commute a great distance. The loss of this workforce "would inevitably produce a delay in resumption of operations."[30] The site should be accessible to public transit or a highway (but at least a quarter of a mile away to avoid vibration), and there was no need to access rail lines. Finally, the lab used a great deal of electricity, gas, and water; therefore, local utilities needed to be adequate.[31] Water was a particularly pressing concern in Pittsburgh's outer suburbs, where many homes relied on wells that would not meet the needs of a laboratory.

After considering several sites, mostly located in the eastern suburbs, in February 1952, Westinghouse settled on a seventy-one-acre site for $200,000 in the suburban borough of Churchill along the route of the proposed Penn-Lincoln Parkway. Churchill, like most of Pittsburgh's eastern suburbs, was no stranger to "Westinghouse people." In fact, the company's employees had been instrumental in the borough's secession from rural Wilkins Township in 1934. At that time, the land that became Churchill was home to two country clubs and the large estates of corporate executives. Mostly as a result of their belief that the township excessively taxed and obstructed the development of their land, in February 1934, forty-four of forty-five landowners had voted to secede and create "a community to which they could retire and be free of the hustle, bustle, dirt, and factories of the city."[32] Several months after secession, the *Pittsburgh Press* observed that landowners were busy subdividing their estates and creating "restricted" communities. The president of the borough council, H. C. Barton, told the *Press* that they aimed to keep Churchill

"highly restricted," in order to ensure "a friendly group of neighbors; people like those residing here who hold responsible positions." Among those people were the borough's seven new councilmen, two of whom were high-level executives at Westinghouse. In the midst of the Depression, the *Press* noted that "the backers of Churchill Borough have built for themselves a community free from the outside world."[33]

Very little had changed by 1952, when Westinghouse moved to acquire land in Churchill. Speckled with country clubs, estates, and new subdivisions, Churchill was growing at the second-fastest rate of any municipality in the Pittsburgh region, quadrupling from 430 residents in 1940 to 1,723 in 1950. Despite this population growth, the borough made no zoning provisions for industrial use and very little provisions for commercial use. As the secretary of the borough proudly stated in 1951, "zoning is so tight your mother-in-law can hardly move in with you."[34] It also remained the home of many Westinghouse executives and researchers, including Charlie Weaver, the vice president of the Atomic Power Division and the former president of the Blackridge Civic Association (a Churchill subdivision); L. W. Chubb, the former director of the Research Lab; Stewart Way, the head of the Combustion Lab; and Daniel Alpert, the current head of the Physics Department and the soon-to-be-appointed associate director of the Research Lab. "Westinghouse people" also played a prominent role in local politics, with Alpert serving on the local school board and two Westinghouse employees—Earl Crawford, a researcher, and Roscoe M. Seybold, Westinghouse vice president and controller—serving on the borough council.[35] Westinghouse employees and their families contributed to Churchill's development as one of Pittsburgh's most affluent and restrictive suburbs. In 1950 "Mrs. L. W. Chubb," the wife of Westinghouse's research director, appeared before the borough council to support a zoning change that would prohibit smaller lot sizes because it was "for the betterment of the Borough" to "maintain zoning high."[36] Ironically, two years later, in order to finalize its land purchase, Westinghouse first had to have the exclusive community rezoned.

On January 7, 1952, Westinghouse submitted a petition to the Churchill council requesting the rezoning of its seventy-one-acre parcel. In the petition, it promised that the new research lab would not produce "dust, dirt, or fumes" and that "no products would be manufactured." It would be "completely landscaped" and would "enhance the appearance of the Borough."[37] Zoning

Ordinance No. 120 created a new zoning district, U-7, that allowed only one additional use within the borough: research laboratories.[38] It defined a research laboratory as

> a building or group of jointly used buildings in which research is conducted by the owner thereof to discover new scientific facts and principles for the sole and exclusive purpose of developing new and improved products to be manufactured by such owner at other locations and in which research laboratory and the land appurtenant thereto no products are manufactured or offered for sale and no services are offered for sale, and in which no operations will be conducted that will constitute a public menace.

The ordinance was very explicit in its intention to not allow any manufacturing within Churchill. It defined nuisances broadly as "odor, dust, smoke, gas, vibration, or noise or interference with radio or television reception" or any other uses that are "incompatible with the primary use of property in this Borough as an essentially residential community." The ordinance restricted building height to seventy-five feet and allowed build-out of only 15 percent of land.[39] These restrictions were intended to ensure that only research occurred on the plot and that the building conformed with the suburban character of the surrounding neighborhoods. The ordinance enshrined a definition of research as mental work removed from sales and manufacturing. This was inaccurate; for example, the laboratory frequently pursued outside contracts and manufactured prototypes, but it did reify a class distinction between research and manufacturing that was essential if the lab was to fit into the exclusive community.

Prior to the public hearing on Ordinance No. 120, residents began to send letters in support of Westinghouse to the Churchill council. E. M. Elkins, who shared the same mailing address as Westinghouse headquarters and owned six acres in the borough, wrote that the proposal "will be of material benefit to the Borough."[40] In a lengthier letter, Charles A. Williams, an employee of the University of Pittsburgh's Business School, encouraged the council to "attract this highly desirable facility." He described Westinghouse's "fine reputation," something, he insinuated, many council members were "more keenly aware than I." He reminded the councilors that "the activities of a research laboratory are a far cry from those of a manufacturing plant" and that the facility would improve the borough's tax base. As if this were not enough, he asked the councilors, "The type of person whom such a laboratory will attract to our community? Is it possible to find a better?"[41] Churchill first reviewed the proposed zoning ordinance at an informal town meeting, where residents heaped more praise on Westinghouse. After a presentation by Westinghouse vice president A. C. Monteith and a discussion among the attendees, 158 Churchill residents voted yes to the proposed ordinance, 14 no, and 9 no opinion.[42]

Support for the ordinance was similarly high when it was presented to the Churchill council the following week. The meeting began with brief presentations from Monteith and Hutcheson, both of whom pledged Westinghouse's appreciation of residents' shared "spirit . . . to maintain a residential atmosphere." Hutcheson presented slides showing the design of the lab. Among the slides was a map of existing employee homes, clustered mostly in Pittsburgh's eastern suburbs. The new location in Churchill "would mean essentially nothing to employees." Consequently, Hutcheson expected no employees would have to move, and this made it "very desirable for us to locate in this general area." Of course, Churchill was more than a central place, and Hutcheson emphasized that "the people in our laboratory are scientists and engineers," and "to these people the atmosphere in which they live is very important." Echoing Westinghouse's employee recruitment materials at the time (see chapter 2), he said that Churchill offered such people comfortable suburbs and easy access to Pittsburgh's "cultural facilities." Hutcheson and his predecessor Chubb, who was a Churchill resident and in attendance, had once considered moving the lab out of the region, but once Pittsburgh was "improving" in terms of "smoke nuisances, and other things," they realized that "every advantage could be retained by staying in this area." Finally, Hutcheson assured the audience, a research laboratory is not a factory. "We are not in the business of producing apparatus," he said. "We are in the business of developing ideas." The lab required no railroad, because "ideas constitute our output" and "our production goes out . . . in the form of reports."[43] Once again Westinghouse reified an absolute distinction between the esteemed mental work of researchers and the labor that took place in its factories.

The vast majority of the residents in attendance were convinced. Each was invited to explain whether they supported or opposed the ordinance. Forty-six spoke in favor and five against. Among those in favor, comments included the following: "we know anything Westinghouse would do they will do right"; "Westinghouse is a firm whose word is as good as its bond"; the lab will have

a "stabilizing effect"; and it is "an opportunity we can't afford to pass by." Of those opposed, two residents were concerned that the precedent could open the borough to multifamily homes, "a mental institution," or "a private school . . . say for mental deficient children." Another opponent, A. J. Penshenka, a homeowner adjoining the site, spoke twice about his fear that the borough would be "attacked with the atomic bomb" because of the lab. Hutcheson tried to assure him that the work of the labs took decades to develop and therefore would not be a target, but Penshenka was unconvinced. The most serious complaint came from the Pehna family, who lived next to the site. The Pehnas, represented by their attorney, put forward a formal protest, claiming that "whatever name you call it, it is still industrialization" and would "lower the quality, characteristics and uses of the properties within the Borough."[44] This complaint took nearly a year to resolve, with Hutcheson noting at one point that "we will try to find some way to settle it out of court" and enlisting Gwilym Price Jr., a local judge and the son of the Westinghouse president, to intervene.[45]

The Pehnas' lawsuit was not the last hurdle the lab would face. Westinghouse first became aware of the Defense Production Administration's (DPA) delay in granting a certificate of necessity in the summer of 1952. Such a certificate was necessary in order for the lab to be eligible for accelerated amortization. Hutcheson believed this delay stemmed from the DPA's position that such certificates were granted only to manufacturing-related facilities. He found this absurd, noting the example of a recent GE electronics laboratory in Syracuse, New York, that was granted a certificate. In a statement that he did not share with the residents of Churchill, he argued that the new lab "is as much a part of the . . . manufacturing facility as any laboratory of any kind associated with any other industrial concern."[46] Westinghouse's friends in the Navy and Air Force quickly intervened, and the lab's certificate of necessity was once again presented to the DPA for approval.[47]

At this point, although the DPA was convinced that the lab did critical defense work, it was now concerned that it was located in a critical defense area. In correspondence with the Pittsburgh Area Industrial Dispersion Committee (PAIDC), Hutcheson explained Westinghouse's rationale for selecting the Churchill site. He noted that the company had surveyed six properties and found none suitable except the one chosen. In fact, the one selected was the furthest from downtown Pittsburgh. The reasons for its selection were that "it is actually somewhat closer to the present homes of the laboratory employees"

than the present lab and that it had access to utilities. Finally, Hutcheson stressed that since the Forest Hills lab was actually closer to major industrial plants, "the proposed move does not . . . increase the potential of this area as an enemy target."[48] While the PAIDC was convinced and approved the Churchill site, the DPA was not. As the DPA failed to produce a certificate, Hutcheson privately communicated to Monteith that he thought the best course of action was to continue with the Churchill site regardless of the DPA's decision. Among his reasons were a lack of alternative sites that provided utilities and would not result in the loss of "a substantial fraction of our service personnel, and too many of our technical personnel"; the unlikelihood that the company would be able to recoup its $200,000 investment; and its "moral obligation" to Churchill, which had passed Ordinance No. 120 based on Westinghouse's guarantee that it would build its lab on the site.[49]

Monteith and other executives must have agreed, because construction soon began on the site without a certificate of necessity. In September 1954, Hutcheson made a final attempt to convince the DPA to grant a certificate. In a nine-page memo, he explained in detail the rationale behind the site location. He began by arguing, somewhat exaggeratedly, that Westinghouse was building the lab "due entirely to the demand for such facilities in development of information and equipment for the Department of Defense." As a result, there could be no dispute that the research lab was a "critical" facility. He told the DPA that the primary criterion for choosing a site was its proximity to the homes of laboratory personnel. For scientists, he argued, this was important because they often are "individuals who have strong interests of a cultural nature," and therefore they "insist their homes be located so that it will be possible for them to find an outlet for these interests." If Westinghouse located its lab in a remote location, "our scientists would have sought work elsewhere." Nonscientific personnel, on the other hand, "are people of such caliber" that they can find work elsewhere. As usual, Hutcheson mentioned the lab's need for utilities and to consolidate research operations that were scattered across Pittsburgh.[50] Four months after receiving Hutcheson's memo, the DPA issued a certificate for 25 percent of the research lab's value, the portion it deemed related to defense work.[51]

Like many private facilities subsidized by the federal government after World War II, Westinghouse first selected a site that met the company's needs and then advocated for its suitability for defense dispersal. In other words, federal dispersal policy did not induce industrial decentralization; rather, it

encouraged and subsidized industries' already established preference for suburban locations. In locating new facilities, private firms and the federal government had to weigh a variety of exigencies, including the ability to attract skilled workers, all of which were considered vital to national defense.

Designing the Westinghouse Research Laboratories

Hutcheson had a clear plan for the design of the Westinghouse Research Labs: it was "a direct copy" of the number 2 building of the Bell Laboratories in Murray Hill, New Jersey.[52] Besides alterations to the ductwork and roof, Hutcheson rejected any major change to Bell's "fundamental plans."[53] The desire to copy Bell Labs is not surprising. According to Mozingo, the 1941 Bell Labs, with its suburban setting and flexible laboratory space, "redefined corporate standards for research and development facilities" and "invented the fundamentals of a corporate campus."[54]

William J. Rankin identifies two features of the Bell Labs that he argues became defining characteristics of postwar research laboratories: "moveable industrial partitions" and "a spacious forested site."[55] In fact, Westinghouse first incorporated moveable partitions in its 1916 laboratory, and C. E. Kenneth Mees had singled it out at that time (see chapter 3). At the new Westinghouse Research Labs, each researcher's laboratory could be customized by moving steel partitions in six-foot increments and was supplied with a full array of gases, vacuums, and various electrical voltages and phases.[56] In the architects' design, they emphasized that the modular concept "provides for the flexibility and adaptability of space arrangement that is required by present research methods." Besides workshops, labs, and office space, the new laboratories also included a cafeteria, lecture hall, and library. The exterior of the building was red brick, selected to "recall the warmth of Colonial Williamsburg." Otherwise there was little ornamentation "in keeping with the entire functional aspect of a great research organization" (see Figure 8).[57] An added advantage of copying Bell's design, Hutcheson pointed out to Westinghouse headquarters, was that it greatly reduced architectural fees.

As for "a spacious forested site," Westinghouse had little choice in the matter. Churchill Borough Ordinance No. 120 allowed it to build on only 15 percent of its land, and Churchill residents were vigilant about the lab's appearance. At the first zoning hearing, residents quizzed Monteith about landscaping. He assured them that Westinghouse would leave most of the

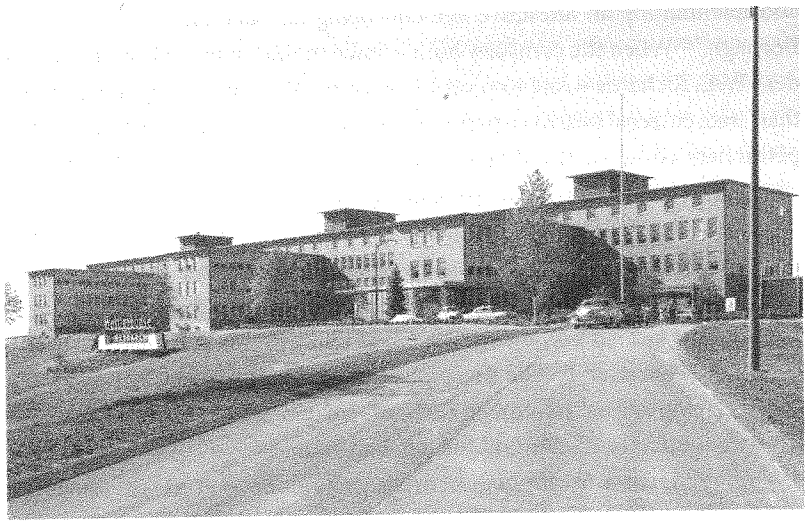


Figure 8. Westinghouse Research Laboratories in Churchill in the 1950s. Westinghouse Electric Corporation Records, Detre Library & Archives, Senator John Heinz History Center.

property "very much as nature has set it down" and the area immediately surrounding the building would be "landscaped . . . the same way as you would around your home."[58]

Westinghouse recruited a laboratory employee, materials engineer Frank Cassel, to design the landscaping. Cassel had frequently published articles in the lab's newsletter on landscape design (including an attack on lawn ornaments and an appreciation of Thomas Church) and had designed the Forest Hills lab's gardens in the "French style."[59] He approached the design of the new site with the same zeal and expertise with which he instructed fellow employees on shade gardening.[60] In the *Research Newsletter,* he introduced his design, emphasizing that he attempted to use plantings to enhance the surrounding community's views. "The landscape about the Center," he wrote, "will not only be a pleasant setting but will be of interest to the personnel and visitors."[61] After the lab's completion, the research director regularly invited Churchill residents and local garden clubs to tour the grounds.[62]

For their own part, residents and the borough council provided frequent feedback on the appearance of the lab. In 1958 the borough council sent an official letter to the lab's staff thanking them for their "efforts in developing

and maintaining an attractive site and being an outstanding credit to the Borough."[63] When the company built a fence in 1966, council borough president W. E. Richards wrote to research director William Shoupp to warn him that "irate citizens" bearing a petition attended the last council meeting.[64] The petitioners co-opted the rhetoric that Westinghouse had used to gain the community's approval. Their spokesperson observed that the "unneighborly fence" was "hardly consistent with maintaining the lands 'natural beauty' nor does this contribute to the 'university type appearance' that the laboratories were purported to engender." Moreover, the speaker worried, is Westinghouse "getting first call" in borough government and will this eventually invite an "industrial character"?[65] The residents were right to worry that Westinghouse was receiving special treatment. Richards invited Shoupp to the University Club to discuss the matter and the fence remained.

On June 12, 1953, Westinghouse broke ground on what Hutcheson called "the most modern Research Center in the entire electrical industry." The press release for the groundbreaking emphasized the key components of the lab: its suburban setting, modular design, and location near Renaissance Pittsburgh. The site, described by Hutcheson as "wooded and rolling," would become "a place of beauty as well as efficiency." The generous suburban site would "also provide the necessary space and flexibility" for expansion. John Elder, the president of the Churchill council, welcomed a new neighbor that would bring "beauty and desirability" and "international prestige." Finally, Hutcheson noted that Westinghouse chose Pittsburgh because the region was "acting as well as talking when it comes to progressive community development." It was "a growing area where people not only talk about problems but do something about them."[66]

"The Free World's Industrial Research Capital"

Westinghouse celebrated the opening of its new Research Laboratories with a meticulously orchestrated spectacle that reinforced the exceptional character of the lab and its employees. A month before the lab's unveiling, Hutcheson informed interim director Clarence Zener, a metallurgist, that the dedication was "vitally important" and "must take precedence over everything else." He reminded Zener that the event would "help create the proper image of Westinghouse."[67] In the lead-up to the dedication, the two main planners released almost daily memos to the labs' employees, many of them addressed

from "Fates at Bay" and likening the festivities to D-Day.[68] Westinghouse developed a six-day blitz of events, each of which was "aimed at various publics—the general public, the scientific world, important customers, educators, the financial community, civic leaders, and the community in which the laboratories are located."[69] Targeting audiences from the local to the national scale, the dedication impressed upon these multiple "publics" the lab's importance for employees, nearby residents, the Pittsburgh region, and investors as well as for scientific advance, national defense, and human progress.

The first two days were devoted to the national media. Westinghouse chartered planes from Chicago, New York, and Washington to collect reporters and housed them at a hotel in Oakland. A memo instructed employees to be on their best behavior. They were warned to keep the lab clean enough to be eligible for the "Good Housekeeping Seal of Approval," to drink coffee near the dispenser so the "floors won't be stained," to "keep desks . . . and *window sills* clear of clutter," and to remove homemade signs.[70] This was intended to present the lab as mess free while masking many of the problems researchers had discovered when they arrived, hence the homemade signs.[71] The two-day tour was a success. Media coverage, which appeared in all major U.S. publications, was mostly of the sort that claimed that Westinghouse research would "unlock the secrets of the universe."[72] Westinghouse also ran full-page ads touting the Research Labs as the "climax" of "the greatest decade in research and engineering progress in the history of Westinghouse."[73] The company also produced a fifteen-minute television special, "Westinghouse in the World of Research," and two shorter clips. According to Westinghouse, coverage reached 50 million readers and 110 million television viewers.[74]

With media days over, a memo told lab employees to "preserve your strength," because there were still four more days to go. Next up was family night, when employees' families were invited to visit the lab. Again researchers were reminded to keep the lab clean and also asked to leave their blinds at half or full length to "give a neater appearance."[75] Family night was followed by science teachers' day, during which lab employees traded places with local teachers for the day in order to reach the "school public." To ensure an adequate supply of researchers, U.S. Steel, Gulf, and Alcoa also contributed employees to the effort.[76]

Lab employees were required to attend the official dedication on September 20—but were not invited to the VIP reception. Tellingly, for a building

that had few women's bathrooms to begin with, most were converted to men's bathrooms for the day. The many guests of honor included "numerous company presidents, Chairmen of Boards, research directors, college deans, editors, vice presidents, chief scientists, 'etc, etc, etc.'"[77] The keynote speakers were MIT president James Killian and Westinghouse president Gwilym Price. Price occupied much of the festivities with a lengthy and characteristically ridiculous speech that was later printed in pamphlet form. He began by noting that the lab was an "epochal step for Westinghouse" and the electrical industry's "most modern research facility." "To Pittsburgh and to Pittsburghers," the lab was "one of three major research installations . . . dedicated in the past eleven months" and one of fifty laboratories within twenty miles of the Golden Triangle. This was, according to Price, who frequently sacrificed accuracy for boosterism, "a concentration of research facilities not paralleled in any other area of the free world." Price noted that six months earlier, he had declared Pittsburgh "the free world's atomic headquarters for atomic power." Today, "after serious deliberation," it was his duty to declare Pittsburgh "the free world's industrial research capital."[78]

Having crowned Pittsburgh the capital of atomic power and industrial research, Price went on to describe recent scientific "revolutions" in the United States. He claimed that these revolutions resulted from the federal government and industry's increasing investment in research. Price emphasized that these two investments were complementary and would continue "so long as Russians keep on acting like Russians" and companies have to "make a profit in order to stay in business."[79] A happy marriage of government and industry would overcome the Soviet Union and many other problems, but to ensure this was the case, Price encouraged the audience to contact their congressmen to "support federal funding for science."[80] Like many an executive, Price was fine with state spending, so long as it was spent at Westinghouse.

Caught up in the gravity of the moment, Price focused very little on the Research Labs itself. When he did, he described it as Westinghouse's gift to scientists and the world: a place where scientists would solve the world's problems, make things "smaller, simpler, cheaper, better," and improve the world's standard of living by at least 50 percent. But this would occur only if Westinghouse granted researchers freedom to pursue their work: "All industry can do is give its scientists the best possible technical facilities, surround them with a pleasant physical environment, honor their status, encourage them to talk about their work in print—and then wait."[81] Price once again

recycled the decades-old point that research labs were an exceptional workplace for exceptional and free technoscientific workers.

Price concluded by noting that the lab offered "material growth" to Westinghouse, but it was impossible to "prophecy" at this moment of "revolutionary" change what direction this growth would take. Despite this uncertainty, he was sure that if Westinghouse remained loyal to the principle of freedom enshrined in science, free enterprise, and the United States, then the company would lead the world in scientific innovation. He closed:

> We do know, however, what research *could* mean to us. In pushing back the frontiers of science through organized research, in allowing human ingenuity free play, we could be led to a solution of national and world problems that now beset us. We may learn the basis of human conduct and so end some of our waste of human talent and erosion of the human soul. We may come to understand the nature of matter and the processes of living organisms. We may reach the highest levels of creative thought and ability. We build a new America, and perhaps help to build a new world, richer in spiritual and cultural values as well as in material things.[82]

As researchers returned to their benches and raised their blinds on the manicured grounds, they could be certain that they were special and their work was of enormous import for Westinghouse, the United States, and the world. For Churchill residents and local politicians, they knew that their neighbor was not a manufacturing plant but a modern research facility that would increase the prestige of their community. For Pittsburghers, the lab symbolized the continued renewal of the region, led by benevolent corporate leaders and their firms. For the scientific community, political and military leaders, and the press, Price laid out a vision of how the research of industrial firms was vital to security, prosperity, and scientific advance.

More than a decade earlier, Vannevar Bush had similarly outlined the central place that scientific research would have in the maintenance of postwar prosperity and security. He outlined a vision of how a partnership between the state, universities, the military, and industry would overcome the "endless frontier" of scientific innovation. He described how American prosperity and security resulted from three national characteristics: "the free play of initiative of a vigorous people under democracy, the heritage of great natural wealth, and the advance of science and its application." As it had in the past, "government

should foster the opening of new frontiers." If government failed to do so and if scientific advances were not "continuous and substantial," then "the national health would deteriorate," employment opportunities would wane, the standard of living would decrease, and "tyranny" would threaten. Bush proposed that a partnership of state, science, and industry would provide scientists with the freedom *and* financial support to deliver the United States and the world into a new era of endless progress, security, and prosperity.[83]

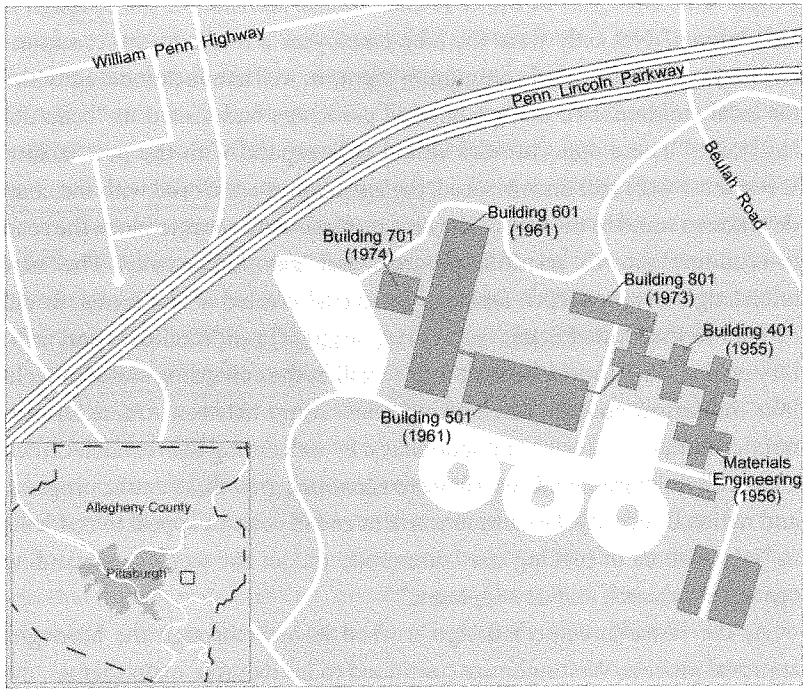
By 1956, when Price spoke, much of Bush's vision had come to pass.[84] The federal government had created the National Science Foundation and the Atomic Energy Commission and was already funding them at levels well above what Bush called for in 1945. Similarly, with the approval of National Security Council (NSC) Report 68 in 1950, the federal government enshrined the principle that defense spending on research was vitally necessary to preserve national security and economic growth.[85]

The Westinghouse Research Laboratories was part of the company's effort to join and profit from this effort. The labs were one component of a national partnership of industry, scientists, and the state that if successful would deliver progress and prosperity worldwide. The pristine landscaping and modern architectural form of the suburban research lab represented not only the development of scientific solutions to the world's problems but also the place that the private sector would have in creating these solutions. These temples of research, devoted to the uncoerced collaboration of industry, the state, and science, would both answer the threat of communism and provide a capitalist solution.

Research and the Suburbs

Price was right about at least one thing: the Research Labs continued to grow over the coming decades (see Map 4). On the day of the labs' dedication, Westinghouse had already submitted plans for an addition, one-half the size of the existing facility, to house the Materials Engineering Department that was scattered across Pittsburgh.[86] This addition was identical in design to the existing lab, and the Churchill council swiftly approved it.

In 1959 Westinghouse made plans for a major expansion of the labs, now renamed the Westinghouse Research and Development Center. Once again it described the lab as an ideal partnership with the exclusive Churchill community. According to Westinghouse, by supporting the lab, Churchill



Map 4. Growth of the Westinghouse Research and Development Center from 1956 to 1974.

would contribute to scientific advance, national security, and its tax base and desirability. Westinghouse assured Churchill residents that the "new buildings and associated land areas are designed to fit into the character" of "an area of beautiful homes and natural surroundings."[87] The announcement detailed the features of the modern Skidmore, Owings, and Merrill design, which was a radical departure from the 1956 lab. The design included two long white buildings that formed a "university-type quadrangle" with a courtyard at the center. The proposed research center "not only provides the proper environment for our scientists, but insures an attractive view of the center for the surrounding community." This was sure to be "harmonious and pleasing" to the borough's residents; and the expansion would not involve manufacturing, nor would it produce any "noise, smoke, or odor."[88]

The expansion would also draw more prized professionals to the borough; currently "10 percent of the families in Churchill Borough are Westinghouse

people" and "their role in the civic and cultural activities of the borough is well-known." Not only were the lab's employees a credit to the community, but the lab also hosted community events as well as educational activities for local children, and many Churchill gardeners had visited its "beautiful landscape." These opportunities would only expand with the new facility. If residents were still unconvinced, the announcement closed with the coup de grâce: to stand in the way of the new research center was to block the road to economic growth, scientific progress, and "national security." The "new knowledge, new concepts, and new products" created at the center would be vital to the United States' "industrial progress" and "economic and military power." The announcement made explicit the collapsing scales of Cold War militarism and the interlocking relationship between American economic, military, and scientific supremacy. By welcoming the research center, Churchill residents could contribute to economic growth, scientific progress, and national security. The announcement ended with an appeal to residents to "join with us in making our community one of the world's outstanding centers of research and development."[89]

As the research center's design worked its way through the borough's approval process, Westinghouse continued to hit its three main themes: the design of the research center fit into the community; the research center contributed to Churchill; and by supporting the lab, Churchill residents supported the United States scientifically, economically, and militarily.[90] S. W. Herald, vice president of research at Westinghouse, reiterated these points when he spoke to a public hearing on August 18, 1959, about further rezoning of the site. He started off by noting that, "to some degree," if the borough agreed to the proposed expansion, then it was "contributing to this country's research and development progress." Such progress was vital because without it, "our nation's position, both as an economic and military power, is jeopardized." The research center itself would be "a pleasant place to work" and "a place of beauty for our community." He added the usual list of benefits that Westinghouse provided Churchill. It currently paid 13 percent of local school taxes and 25 percent of borough taxes, was a "good neighbor" and laid out the "welcome mat" to local organizations, and hosted science education programs. The biggest benefit the research labs provided was an influx of "Westinghouse people" into Churchill.[91] The zoning amendment passed with five members of the council voting yes and one voting no.

In 1969 Westinghouse made plans for yet another expansion of the research center, this time to house administrative offices. The space that this new building would free was desperately needed as the lab was increasingly oriented toward "division needs," "new product activity," and "cost-price improvement goals." This required more laboratory space in which to test new production processes and products. Likewise, the equipment needed for research was growing, including increasing space devoted to computers. Finally, Westinghouse required larger facilities in order to enter promising new fields of federally financed research, many of them opened up by the urban crisis, including "pollution control, personal services, leisure time activities . . . construction technology, medical and prosthetic devices, power electronics, urban renewal, surveillance systems, and education."[92] Mirroring the growing allocation of federal research funds during the late 1960s, the research center was increasingly organized around "systems research," with a growing focus on "research relevant to social problems."[93]

An added advantage of the proposed addition to the research center was that it dealt with pressing "aesthetic considerations" and improved "the corporate research image." One of Westinghouse's main objectives in 1969 was to block the view of the 1956 Research Labs (renamed Building 401) and thereby "greatly improve the outsider's impression of the R&D Center." Building 401, a symbol of modernity thirteen years earlier, now needed to "be brought into conformity with contemporary Corporate Design policy." Westinghouse had painted Building 401's "warm colonial Williamsburg" brick white in 1968 to make it blend into the 1961 addition, but it nonetheless "does not 'fit' the modern design of the complex." To be blunt, as one Churchill councilor complained, Building 401 looked like a "textile mill out of Lawrence, Massachusetts," and should never have been built.[94] The new addition resolved this problem by blocking the view of Building 401. Improvements to the appearance of the complex were also necessary from a "community relations standpoint" because the research center's location in "Churchill Borough, an exclusive residential area, demands special attention to the architectural beauty of the site."[95]

Throughout the lab's development, Westinghouse derived local benefits from emphasizing the research that took place there. Churchill residents were highly resistant to any indication that it was a manufacturing facility. As a result, at nearly every meeting where Westinghouse presented plans for