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THE SST AND INVERSE CONDEMNATION

Jerome Neil Kline†

Darius was clearly of the opinion
That the air is also man's dominion,
And that, with paddle or fins or pinion,
we soon or late
Shall navigate
The azure, as now we sail the sea.

JOHN TOWNSEND TROWBRIDGE

Darious Green and his Flying Machine

INTRODUCTION

IN A WORLD of continually advancing economic and technological development, changing customs and mores, increased efficiency in general, and in rapid transit in particular, there is a great need for our political bodies, governmental institutions, and court systems to assume a responsive, activistic role. In particular, the advent of supersonic air transport is a most recent example of a problem which we will have to meet. This has been ably stated as follows:

The SST introduces a new kind of noise into our environment, in that it covers a very large area at high enough levels to be very annoying to large numbers of people, and probably damaging to property, whereas previous noises from aircraft at levels high enough to be disruptive have been confined to the vicinity of airports. This new dimension of noise will undoubtedly require development of additional legal concepts to meet it.¹

During the last week of 1968, the Soviet Union became the first nation to fly a supersonic transport, reportedly beating the United States entry by 3½ years, and the British-French Concorde SST by weeks.² Prior to that time, there had been considerable controversy

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2. "The United States plane is scheduled to fly by mid-1972 and the Concorde by late this month or February." Wash. Post, Dec. 28, 1968, at A-1, col. 3.
over the United States' involvement in this area. Even in 1970, Congress and the public at large are maintaining a continuing dialogue as to the efficacy of spending huge sums of money for our entry into supersonic transport international competition. Naturally, great numbers of individuals have been, and continue to be, very upset over the potential dangers and annoyances that would accompany the SST and its sonic boom. Considerable conflict has arisen due primarily to foreign and domestic political pressures. However, after much vacillation, the Nixon administration has reached a decision in favor of developing the SST.

In order to divert increased governmental expenditures away from what is considered wasteful and unnecessary spending on commercial and military supersonic transports, it is necessary to engage in a colloquy regarding present governmental decision making. Thus, the effect of the sonic boom upon the legal theory of "inverse condemnation," and, in turn, the effect of "inverse condemnation" on the development of the SST, provide the subject matter of this article.

**Inverse Condemnation**

"Inverse condemnation" is not a new legal concept. Its roots are firmly imbedded in the United States Constitution. In effect, it is an action brought by an oppressed landowner whose land is not formally arrogated for a public use (although allegations by petitioners may be to the contrary), but rather is subsequently damaged by a public improvement. In all cases, it is an action for damages based on the standard allegation arising generally in this area is that property has been taken or damaged without just compensation having been paid.

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3. Costs and the final shape of the plane as well as the sonic boom have been impediments to U.S. SST development. "The American program also has been mired in criticism by Congressmen, editorial writers and private citizens." N.Y. Times, Jan. 5, 1969, at 6E, col. 1.

4. "In view of recent developments, airport authorities should consider seriously development in wide open spaces, or be prepared to meet an angry citizen who finds his home in need of repair, and his sleep interrupted because the newest rage in air travel has just passed over his home." Note, Property: Inverse Condemnation: A Growing Problem?, 3 TULSA L.J. 169, 175 (1966).

5. The Interior Department at one time recommended a prohibition of all but experimental supersonic flights over inland areas until more could be known about the public response to sonic boom. UDALL REPORT, supra, note 1, at p. 8; see Childs, Air Traffic Mess Isn't Being Solved, Wash. Post, Nov. 22, 1968, at A–16, col. 8; Wash. Post, Nov. 22, 1968, at A-2, col. 1; in late 1969, the Nixon Administration gave every indication that it would not recommend proceeding with development of the SST. However, the Budget Message for Fiscal Year 1971 made provisions for $290 million to go into this program.

6. It has also been referred to as "reverse eminent domain," a term probably more conducive to lay understanding of the concept. This theory is termed inverse because the eminent domain clause is invoked by a private claimant rather than a public agency.


8. The standard allegation arising generally in this area is that property has been taken or damaged without just compensation having been paid.
on the eminent domain clause of the United States Constitution. However, there is no willingness or intention on the part of the alleged taker to initiate appropriate proceedings.

It has further been deemed to be available where property is taken for a public purpose by a municipality or other agency having the power of eminent domain under such circumstances that no procedure provided by statute affords an adequate or applicable remedy to the landowner to obtain just compensation for his property. Unlike demanding relief against a governmental body on the basis of a "nuisance" which may be barred by the doctrine of sovereign immunity, this action may be brought under this self-executing consent for "inverse condemnation" damages.

"Inverse condemnation" claims can be divided into two categories: 1) those arising from physical damage to property, and, 2) those arising from non-physical damage to property. These distinctions are cogently explained in the litigation process. "Inverse condemnation" proceedings often go beyond traditional, and outmoded dogma, which normally allow eminent domain compensation for palpable, physical takings only. More recent cases, as will be later reviewed, indicate that an impairment or destruction of property interests may give rise to liability in accordance with the eminent domain clause notwithstanding the absence of physical invasion.

Many writers emphasize a non-overlapping or distinctness in terms in discussing "police power" and "eminent domain." Without

9. "[N]or shall private property be taken for public use without just compensation." U.S. Const. amend. v. See Mandelker, Inverse Condemnation: The Constitutional Limits of Public Responsibility, 1966 Wisc. L. Rev. 3. This article provides an excellent survey of the "inverse condemnation" theory and a large sampling of the multitude of problems arising thereunder; see also Mandelker, A Review of Inverse Condemnation, ABA SECTION OF LOCAL GOVERNMENT LAW, REPORT OF COMM. ON CONDEMNATION LAW PROCEDURE 193 (1964).


11. It has always been felt by judicial authorities that inverse condemnation: is unequivocally a way of avoiding the sweep of the sovereign immunity doctrine. See Angelle v. State, 212 La. 1069, 34 So. 2d 321 (1948).

12. These would include a loss of view and reasonable access, including loss of access from change of grade. Damage due to noise, dust and fumes could be placed in either category, tending to blur the efficacy of drawing such distinctions. Mandelker, supra note 9, at 4-6.

13. Others have made similar characterizations as follows: 1) Government action which works as a physical invasion of the landowner's space, e.g., flooding, low air flights, etc. 2) Extinguishment, without physical invasion, of private rights, by the exercise of powers under government contracts. 3) Destruction or substantial impairment of private property interests by regulation without physical invasion, public improvement or government contract action, e.g. destruction of air access to private lands by government regulation. See generally Beuscher, Some Tentative Notes On The Integration of Police Power and Eminent Domain by The Courts: So Called Inverse or Reverse Condemnation, 1968 URBAN LAW ANNUAL 1.
immersing into this morass, it is this writer's belief that the dichotomy is a flexible one. While the two theories are, in a sense independent, the cases making reference to the dilemma indicate that an intransigent approach is not desirable. Thus, this article will be concerned primarily with the fact that a right to compensation in this area emanates directly from the Constitution and is not dependent on police power regulations or statutory mandates.

Substantive Framework for Inverse Condemnation

In inverse condemnation cases, three major avenues are open to the courts. They may: 1) rely upon analogous doctrines in property or tort law; 2) make an independent interpretation of the eminent domain clause without reference to either tort or property law; or 3) make interpretations of the eminent domain clause, ostensibly not based either on property or tort law concepts. It should be noted, however, that no clear cut trend or analytical pattern has consistently emerged. In fact, since a framework for this area must perforce be flexible and dependent upon diverse factual contexts, the approaches courts have taken have been, for the most part, extremely vague. Thus, court rationales and theories of liability have frequently come under attack. It has been alleged that traditional legal concepts have been distorted and artificial interpretations have been resorted to in order to find liability.

Incidental Damage v. Taking

Numerous treatises, cases, and legal doctrines have addressed themselves to the question of what constitutes a "taking" and what encompasses a "public purpose" as these provisions are used in the fifth amendment. According to the ratiocination provided for the

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14. See e.g., Angelle v. State, 212 La. 1069, 34 So.2d 321 (1948); Nagle v. Caddo Parrish, 175 La. 1054, 244 So. 425 (1932); Booth v. Louisiana Highway Comm'n, 171 La. 1096, 133 So. 169 (1931); Demoss v. Bossier Parrish, 167 La. 83, 118 So. 700 (1938); Green v. Bd. of Comm'rs, 163 La. 117, 111 So. 619 (1927).
15. Since "inverse condemnation" is premised on constitutional language, careful attention must be paid to it. See Beuscher supra note 13, at 4.
16. In Bydlon v. United States, 175 F. Supp. 891 (Ct. Cl. 1959), "inverse condemnation" was imposed in spite of the fact that the air flight regulation involved a valid police power measure.
17. Mandelker, supra note 9 at 6-7.
18. Id. at 8.
19. See generally Annot., 77 A.L.R.2d 1355 (1961); see also Armstrong v. United States, 364 U.S. 40 (1960); United States v. Central Eureka Mining Co., 357 U.S. 155 (1958); United States v. Dickinson, 331 U.S. 745 (1947); United States v. Causby, 328 U.S. 256 (1946); Portsmouth Co. v. United States, 260 U.S. 327 (1922); Harris v. United States, 205 F.2d 765 (10th Cir. 1953); Bartholomae Corp. v. United States, 135 F. Supp. 651 (S.D. Cal. 1955); State Highway Comm'n v. Stumbo, supra note 7. A "taking" can be effectuated pursuant to the "Implied Con-
public by at least two Presidential Administrations and the applicable federal agencies, it can reasonably be said that experimentation with and utilization of the supersonic transport does constitute a "public purpose." Its sonic boom also would fall within the purview of the constitutional language.

Confusion has been great from the standpoint of the claimant, who on several occasions has alleged a "taking" in situations where mere incidental damage has been found. In one case, the Department of Agriculture was requested by a railroad station to spray and disinfect sweet potatoes. In so doing, a fire broke out causing destruction to the station, processing machine and sweet potatoes. In rejecting the claimants' argument that since spraying itself was a public purpose the appropriation in connection therewith was also a public purpose, the court stated:

This argument is not sound because it fails to reckon a distinction between the destruction and damaging of private property by agents of the State while engaged merely in performance of a...
governmental function and the deliberate taking or necessary 
damaging of property for the public use or benefit. In the first 
instance, the destruction or damage occurs not for a public purpose 
but by reason of the negligence of state officers or agents. In the 
latter, the property is taken or damaged under the power of 
eminent domain; it is an appropriation for public purposes for 
which adequate compensation is guaranteed to the owner by 
Section 2 of Article I of the Constitution. 22 

Thus, the mere fact that damage occurs while a governmental agency 
is involved in work or in a program for an alleged “public purpose” 
is not enough. If damage arises from a negligent act or an incident 
wholly disconnected from the object of the governmental program, then 
there can be no recovery on the theory that there “was a taking for 
a public purpose for which due compensation should be made.” How-
ever, with regard to sonic boom, where damage is generally foreseeable 
as an adjunct to such experimentation or undertaking, the logical 
conclusion seems to be that “inverse condemnation” should be an 
efficacious cause of action.

SONIC Boom

Technical Aspects

Sonic boom has been defined as “a mechanical phenomenon of 
the air, composed of pressure waves and sound waves, generated by 
an object moving through the air at supersonic speeds.” 23 In other 
words, it occurs in tandem with an aircraft travelling through the air 
at a velocity equalling or exceeding the speed of sound. At such times 
pressure waves are generated resulting in a release of energy which 
ultimately creates the loud sound that has become its characteristic 
trademark. The intensity of the sonic boom at ground level will vary 
with the mass, speed, acceleration, and altitude of the aircraft; as well 
as with the angle of attack, maneuvers, turbulence, and configuration 
of the terrain. As the size, weight, and speed of the aircraft increase, 
there is a marked gain in the impact and extent of the sonic boom.

Since sonic boom is a 760 mile per hour mass of compressed energy, 
it can cause destruction in its immediate path equivalent to the force 
of an atomic explosion at ground zero. 24 Its audibility in an area ten 
miles wide at ground level is unavoidable in flights at supersonic 
velocities at proposed altitudes. 25

22. Id. at 1078, 34 So. 2d at 323–24. 
23. Hammon, An Old and A New Legal Problem: Defining “Explosion” and 
25. UDALL REPORT, supra note 1 at 10.
The attainment of supersonic speed causes the creation of two sonic booms that are separated by approximately .2 to .3 seconds. One of these emanates from pressure waves arising at the front of the aircraft and the other from those arising at the tail, i.e., a bow shock and a tail shock that spread over the earth's surface in the same direction as the vehicle. Moreover, the N-wave shock pattern on the ground is the result of the creation of such overpressure and underpressure.26

Sound reaches the listener after the aircraft has passed. This fact, coupled with great speed and the high altitude of the aircraft, makes visual observation of the object most difficult.27

The "cutoff Mach number" is critical in measuring the point below which the shock wave will not reach the ground. If the speed of sound is represented when the Mach number is 1.0, as the Mach number increases the severity of boom impact on the ground shall increase, while no perceptible boom will occur where the Mach number is below 1.0. Utilizing data compiled at 36,000 feet, it can be seen that a greater boom effect will result due to a supersonic descent. In that situation, the cutoff point will be lower than otherwise.28

Any form of aircraft acceleration — lateral, longitudinal, or normal — can cause extreme "focusing" of the sonic boom. "Focusing" causes what are known as "superbooms." For example, SST's, at weights of up to 250 tons, require certain degrees of lift in order to maintain a cruise flight. Such maneuvering is effectuated by slightly increasing the knife-edge aspect of the half-acre wing area. Such an increase in wing aspect at Mach 3 (1800 mph) would result in massive stacking of air molecules which in turn would result in tremendous pressure on the earth's surface. It would be far in excess of that caused by lightweight, negligible lift supersonic fighters. Therefore, the newly advocated and potentially sophisticated SST presents even more significant problems than those associated with ordinary, less powerful supersonic aircraft.29

Technological data currently indicates that the SST will produce a "nominal" boom of 2.5 pounds per square foot over water. "Focusing" effects may cause it to reach 5–6 pounds per square foot. Conse-

28. Ortner, supra note 26, at 211.
29. It is contemplated that the U. S. SST will reach speeds equivalent to Mach 3 and will probably cruise at 60,000 rather than 80,000 feet. Id. at 213.
quently, the potential for damage has been found to have increased in areas over water as well as over land.\textsuperscript{30}

\textit{Effects of Sonic Boom on People}

Supersonic flight presents a myriad of problems because of its ability, even at high altitudes, to create new noise corridors on the ground tens of miles wide.\textsuperscript{31} Since these corridors trace the aircraft’s flight path, and since these need not be permanent paths, no land area would be free from some potential noise intrusion. Thus, if we are to permit the SST to fly in a ramous fashion over the United States, we must expect that the frequency and intensity of the sonic boom would cause a large increase in both the noise level, and the number of people exposed to such noise.

It is expected that by 1975 20 to 40 million people under a 12½ mile wide path on either side of expected flight tracks would be subjected to 5 to 50 sonic booms per day. Each such boom would be the equivalent in terms of decibel levels to the noise produced by a large truck traveling at 60 m.p.h. at a distance of approximately 30 feet, or produced by a four-engine turbo-fan jet airplane within one-half mile of its take-off point. An additional 35 to 65 million people within 12½ to 25 miles of the flight path would be subjected to 1 to 50 sonic booms per day of somewhat lower intensity, and 13 to 25 million more would experience 1 to 4 high-intensity booms.\textsuperscript{32}

Persons experiencing sonic booms are startled and sometimes diverted or, if asleep, may be abruptly and harshly awakened, as would be the case if one were to suddenly hear an explosion. The pulse rate may also increase along with other ephemeral and minor changes in physiological body processes. However, there has been no substantial evidence linking the effects of the sonic boom with bodily physical harm.\textsuperscript{33} Research has heretofore indicated that hearing cannot be endangered or impaired by the sonic boom. It is questionable, however, whether previous tests were calculated for sonic booms of the magnitude that scientists now predict are possible, and whether prior results can be extrapolated into situations involving much more technologically advanced aircraft.

There have been no tests made on animals or on human beings over sufficiently long periods of time in order to ascertain whether

\begin{itemize}
\item \textsuperscript{30} Lundberg, \textit{The Boom Over the Sea}, cited in 113 CONG. REC. 16654 (1967).
\item \textsuperscript{31} This is often referred to as a “boom carpet.”
\item \textsuperscript{32} UDALL REPORT, supra note 1, at 3.
\item \textsuperscript{33} According to data collected as of this date (1960), it can be said that direct physical injury to an individual cannot be caused by a sonic boom. Apotheker, \textit{supra} note 27, at 987.
\end{itemize}
chronic effects can become prevalent. In addition, there has not in fact been frequent or sustained supersonic flights over urban areas in this country. There is, therefore, no way at this time to be certain of what would constitute immediate interference with the well being of our citizens from the point of view of their health.\(^{34}\)

It cannot be overemphasized that we are embarking upon an age even more technologically advanced than that to which we have been accustomed. Because sonic booms, for the most part, have been unobjectionable in the past, it cannot be assumed that they will so continue to be.

In the case of subsonic jet-aircraft, where the noise level is high only in the vicinity of airports, persons far from the airport sense little noise from jet engines. Enterprises, such as schools or hospitals where noise can seriously affect job performance, or people who find the noise intolerably annoying and disruptive, can move away. With commercial aircraft traveling at supersonic speeds on all profitable routes in the United States, blanketing a large share of the United States with repeated booms, there would be virtually no "away" to move to. Many of us have come to tolerate, though grudgingly, aircraft noise, will we also come to accept the sonic boom?\(^{35}\)

Notwithstanding that actual physical damage resulting from the effects of the sonic boom is a matter of conjecture, a large percentage of the public polled during tests conducted in Oklahoma City, Oklahoma in 1964, believed that the sonic boom causes structural damage.\(^{36}\) Scientists, geologists and various other experts have recently experimented and compiled data in the hopes of finding substantive answers to this perplexing problem. For the most part, opinions have differed and no final conclusions have been obtained. Nonetheless, while it can be said that resolutions or determinations must necessarily rest upon numerous variables or factors existing at a given moment, a few general results have been observed. Window and plate glass can be broken and, as a result, adjacent property such as draperies, can also be damaged. Light bric-a-brac may be shaken from shelves and broken. Damage to loosely latched doors can occur, as can further damage to already defective plaster. Structural damage to foundations, floors, load-bearing walls, etc. cannot be caused by sonic boom.\(^{37}\)

34. See generally Udall Report, supra note 1, at 23-34.
35. Id. at 10. See Roth, Sonic Boom: A Definition and Some Legal Implications, 25 J. Air L. & Com. 68 (1958).
37. Apothaker, supra note 27, at 987. Because of atmospheric conditions, wind, temperature, and other variables, a sonic boom caused by aircraft supersonic flight...
Research and Testing Data

In 1960, tests involving twenty-five flights at Mach 1.09 to 1.12 resulted in no glass breakage for sonic boom levels from 0 to 20.0 pounds per square foot (psf). However, there were 2.4 possible breakages of small and colonial residence-type windows. Fifty-one breakages occurred within the pressure range of 20.0 to 100.0 psf.88

During 1961–1962, an experimental program in St. Louis, Missouri, concluded that overpressures of 2.6 psf were not of sufficient magnitude to cause damage to sound plaster and to cause good quality glass to break.89

In tests conducted in New Mexico from November, 1964, to February, 1965, the overpressure range utilized was from 2.0 psf through 28.0 psf with a flight frequency of 30 per day. Observations were similar to those preceding it. Thus, it corroborated conclusions reached earlier. However, certain damage did arise at higher levels of pressure.40 This indicated that in some circumstances sonic booms of greater magnitude will have a causal relationship to extensive property damage. This presumes, of course, that “focusing” or “superbooms” will occur.

Proving a Causal Relationship

During the period from February 3, 1964 to July 30, 1964, the Federal Aviation Agency conducted a sonic boom testing program over Oklahoma City, Oklahoma. As a result thereof, several lawsuits were initiated against the United States seeking redress for damages sustained.41 A number of legal theories were relied upon for relief. However the significant question raised in all of the suits was whether a causal relationship could be demonstrated. In other words, individual claimant property owners had an exceedingly difficult time proving that sonic booms were the direct cause of the alleged damage.42 Thus,
the apparent difficulties encountered at that time evidence further our need for more substantive observations in this regard.

**ALTERNATIVE THEORIES OF RELIEF**

The substantive area of the law covered by the general contents of this article is by no means indicative of the kind of proceeding most often brought by an oppressed landowner. Rather, depending upon the factual setting, the proper action may be one in equity for injunctive relief; in tort for negligence; in tort for absolute liability; in trespass for nuisance; or pursuant to statute, act, or state constitution.

With regard to injunctive relief, *United States v. Causby,* indicated that an injunction for overhead flight was not proper because the landowner owns only as much airspace as he can reasonably use. Moreover, the great social utility of air traffic and the probability of federal pre-emption of flight regulations have led courts to deny injunctive relief in virtually all recent cases.

Nuisance actions have been similarly unsuccessful primarily due to the doctrine of "legalized nuisance" which in effect protects the proper operation of certain publicly authorized facilities in the interest of the general good. However, there have been cases which have expert testimony presented made the cases very close in this regard, and it is felt among the members of Mr. Foster's department that the question is still unresolved.

The large number of lawsuits brought as a result of the Oklahoma City testing program ran the gamut of legal theories. In one such action, a landowner sued the President of the United States. Thus, in *Woodrow Bussey, et al. v. Lyndon Baines Johnson, President, United States of America,* (N.D. Okla. 1964), the complaint alleged that Bussey and his daughter sustained profound mental and physical damages as a result of the booms and asked for money damages in the amount of $101,250,000.00. A motion to dismiss was filed on behalf of the defendant on the grounds that the President was not subject to suit. Order of dismissal was entered by the Court on August 15, 1964. *See also Note, Airplane Noise, Property Rights, and the Constitution,* 63 COLUM. L. REV. 1428 (1965).

In *Angelle v. State,* 212 La. 1069, 34 So. 2d 321 (1948), the proper action was said to be one for negligence.

Nuisance cases have already forced a re-examination of the servitude origins of overflight liability; *See Moore v. United States,* 185 F. Supp. 399 (N.D. Tex. 1960); *Ackerman v. Port of Seattle,* 55 Wash. 2d 400, 348 P.2d 664 (1960); *Cheskov v. Port of Seattle,* 55 Wash. 2d 416, 348 P.2d 673 (1960).


See generally *Udall Report,* supra note 1, at 44-48.

328 U.S. 256 (1946).

*See generally Note,* supra note 43, at 1433-34.

found that a nuisance could ripen into a “taking,” thus permitting an inverse condemnation cause of action.

DEVELOPMENT OF CASE LAW: INVERSE CONDEMNATION

Supreme Court

An augury of things to come with regard to eventual litigation under the inverse condemnation theory appeared in the 1920's. In *Portsmouth Harbor Land & Hotel Co. v. United States*, the plaintiffs alleged that the United States had continuously discharged its battery over the claimants' land. Additionally, it was alleged that a “taking” had been effectuated thereby and that damages should be forthcoming. Overruling a demurrer granted in the court below, the Supreme Court held that there was a taking of a servitude, and that an implied contract to pay might be inferred. The Court went on to say that where acts amount to a taking of property by the United States, without an assertion of an adverse right, a contract to pay may be implied whether contemplated by the parties or not.

Close analysis of that decision indicates that the Court was satisfied to leave future controversies to be decided in their own technological context and was unwilling to dogmatize or to pronounce guidelines for general applicability. It also apparently decided to abstain from constitutional interpretation and to retreat from a discussion of the principles of eminent domain. Rather, the Court was seemingly willing to rest its determination solely on common law property concepts and the “implied contract” theory.

In adopting a flexible standard in 1946, the Supreme Court, in *Causby*, recognized what it felt to be the realities of the day and presaged the eventual direction of our country's technological development. For during this period, we were moving from a relatively agrarian and ruralistic society to a populistic and urbanistic one. In addition, we had passed through the trauma of a depression and World War II, and were ready for economic expansion and scientific advancement. In particular, the period saw the first real proliferation of air transportation.

*United States v. Causby* has not only become the bellwether for current opinions, but in this writer's opinion, has provided the foundation for “inverse condemnation” theory as applied to damage from aircraft. Thus, it is essential to examine the case closely.

52. 260 U.S. 327 (1922).
53. 328 U.S. 256 (1946).
The appellants owned a home and a chicken farm located near a municipal airport which was being used by various military aircraft. The planes landing and taking off therefrom frequently came so close to the claimants' property — barely missing the aforesaid structures — that they caused startling noise and acute illumination from their glaring landing lights. As a result the property could no longer be used as a chicken farm. Furthermore, the landowners lost sleep, and became nervous and frightened. An action was brought in the Court of Claims to recover damages for an alleged taking of property. The Court of Claims found that the Government had taken an easement over the claimants' property, and awarded damages. However, it made no finding as to the precise nature or duration of such easement. After an appeal by the federal government, the Supreme Court granted certiorari.

The Supreme Court was confronted with problems posed by the Air Commerce Act which had legislatively changed property rights in the air over one's land. The Court noted that the utilization of airspace immediately above one's land, while perhaps not completely destroying enjoyment and usage of the land, would limit utility and cause a reduction in its value. In reversing and remanding the case because of a failure of the lower court to determine whether the easement taken was temporary or permanent, the Court went on to espouse a doctrine which still has firm roots in the existing law:

The airplane is part of the modern environment of life, and the inconveniences which it causes are normally not compensable under the Fifth Amendment. The airspace, apart from the immediate reaches above the land, is part of the public domain. We need not determine at this time what those precise limits are. Flights over private land are not a taking unless they are so low and so frequent as to be a direct and immediate interference with the enjoyment and use of the land.

The Court reiterated a former theory by indicating that the character of the invasion is the pertinent factor, not the amount of physical damage emanating therefrom. Moreover, it recognized that

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55. 327 U.S. 775 (1945).

56. The court recognized this to be the philosophy of Portsmouth Harbor Land Hotel & Co. v. United States, 260 U.S. 327 (1921).

57. 328 U.S. at 266.
if land owners were unable to use their land for any purpose, their loss, ipso facto, would be complete.\textsuperscript{58}

The Justices were aware of the consequences due to the normal use of aircraft in navigable airspace. They also recognized that, generally, noncompensable damages flow from such use. However, it was felt that the facts here did not unequivocally indicate that the approach flights were in the navigable airspace, notwithstanding the approval of the glide paths in question by the Civil Aeronautics Authority. Most importantly, the Court agreed that a landowner owns at least as much of the land as he can reasonably occupy or use in connection with his proper use of the surface.

A year later the Supreme Court solidified its position by indicating that property is taken in the constitutional sense when inroads are made upon an owner's normal use of his land to an extent that a servitude has been acquired either by agreement or in the course of time.\textsuperscript{59} Subsequently, it suggested that merely because Congress defined "navigable airspace" to include necessary space for take-off and landing, a property owner was not necessarily precluded from a condemnation action based upon a taking by low flying aircraft, although the taking occurred in navigable airspace.\textsuperscript{60}

\textbf{Lower Federal Courts}

Throughout the entire line of cases dealing with the theory of "inverse condemnation"\textsuperscript{61} and particularly with the problem of whether

\textsuperscript{58} "It would be as complete as if the United States had entered upon the surface of the land and taken exclusive possession of it." \textit{Id.} at 261.

\textsuperscript{59} United States v. Dickinson, 331 U.S. 745, 748 (1947).

\textsuperscript{60} Griggs v. Allegheny County, 369 U.S. 84 (1962); \textit{Reh. denied} April 16, 1962, 369 U.S. 857. This case came from the Pennsylvania Supreme Court: 402 Pa. 411, 168 A.2d 123 (1961). The problem is presented only in the case of a taking caused by the noise of privately-owned civil aircraft, operating to or from a privately-owned (or municipally-owned) civil airport, and controlled by a government control tower.

there has been a “taking,” it is clear that the landowner cannot raise these arguments if the alleged “takings” have occurred prior to his inhabiting the land in question. Also, when acts complained of are performed by the federal government, the claimant must look to the federal constitution for relief and not to state constitutional provisions. Therefore, it has been stated in one United States Court of Appeals decision:

But the acts complained of here were performed by the federal government and the liability, if any imposed, is by virtue of the federal constitution, and state notions of constitutional liability are relevant only insofar as they may be persuasive in the judicial process. Moreover, it should be noted that, unlike many state constitutions, the federal constitution provides only for the payment of just compensation for a taking of private property for public use, and damages to property not taken are compensable only as a consequence of or incidental to an actual taking.

Using this approach, the court held that a single destructive act without a deliberate intent to assert or acquire a proprietary interest or dominion is not a compensable taking. Instead it would be characterized as a tortious act and would consequently fall within the purview of sovereign immunity.

The above mentioned rule was augmented one year later in a case germane to the problem at hand. There, the United States, through its executive agency, the Atomic Energy Commission, performed experiments with atomic energy and nuclear detonations about 150 miles from the claimants’ ranch. In concluding that there was no “taking”

62. See e.g., Highland Park v. United States, 161 F. Supp. 597, 600 (Ct. Cl. 1958) held that if the defendant had an easement before the plaintiff acquired the property, there has been no taking; see also Avery v. United States, 360 F.2d 640 (Ct. Cl. 1964).

63. Harris v. United States, 205 F.2d 765, 767 (10th Cir. 1953) (emphasis added). While the appellants in this case were invoking the Fifth Amendment of the United States Constitution to impose liability without fault for the damage complained of, they cited and relied upon Oklahoma cases construing the Oklahoma Constitution which prohibits the taking or damaging of private property for public use without payment of just compensation.

64. Id. at 767. The court cited for its authority: United States v. Causby, 328 U.S. 256 (1946) on remand, Causby v. United States, 75 F. Supp. 262 (Ct. Cl. 1948); Portsmouth Harbor Land & Hotel Co. v. United States, 260 U.S. 327 (1922); Keokuk & Hamilton Bridge Co. v. United States, 260 U.S. 125 (1922); Peabody v. United States, 231 U.S. 530 (1913); Beford v. United States, 192 U.S. 217 (1903).

65. For the most part, the federal courts have followed an extremely uneven course in trying to distinguish between tortious activity and the imposition of a servitude for which the Constitution implies a promise to justly compensate. See Harris v. United States, 205 F.2d 765, 767, (10th Cir. 1953). In this regard it can be said that no clear cut trend has emerged.

in the constitutional sense, the court, using Supreme Court language, said:

Property is taken in the constitutional sense when inroads are made upon an owner's use of it to an extent that, as between private parties, a servitude has been acquired by agreement or in the course of time. . . . It is the intent of the party, who, it is claimed has asserted a proprietary interest which is the determining factor. This intent may be manifested by a single deliberate act or it may be inferred by continuous or repeated acts, but a single isolated and unintentional act of the United States resulting in damage or destruction of property is not a taking in the constitutional sense.67

The federal courts, in situations where a federal regulation provides for navigable airspace below as well as above 1000 feet, generally hold that such flights cannot constitute a “taking.”68 But, as we have seen thus far, they have had a great deal of difficulty in some cases, within the Causby framework, articulating whether, or at what point in time, there has been a “taking.” In Bacon v. United States,69 the

67. 135 F. Supp. at 654. This case deals with the Nevada Proving Grounds tests which ran from October 22 to November 5, 1951. Detonations caused blast waves and air shock waves which could reach into and bounce or rebound from atmospheric layer elevations and surround the earth. Shock waves are capable of erratic behavior and at the times of the tests they could not be completely controlled. In part, the plaintiff alleged that the United States intentionally took and acquired the right and privilege to shake and damage his property as an unavoidable result of its intentionally detonating of atomic bombs; that this action was a taking for public use within the meaning of the Fifth Amendment to the United States Constitution, and is therefore compensable. Although Harris was used as authority for this proposition, the court here broadened the theory of “deliberate intent”. Moreover, it appeared not to totally preclude a single act from constituting a taking. Thus, this seems pertinent in light of current supersonic transport testing programs; Harris was an action for crop damages sustained by adjoining landowners as a result of spraying operations conducted by the U. S. Government on its own property. The Court of Appeals held that where the government's spraying of herbicide on its own lands occurred only once, and further spraying was not anticipated in the foreseeable future, the alleged injury to crops on adjoining lands did not amount to a taking of property in the Constitutional sense, but rather constituted a tortious act for which the government was only consensually liable. This is significant when it is considered that further supersonic testing and utilization is anticipated and foreseeable.

68. Allegheny Airlines, Inc. v. Cedarhurst, 238 F.2d 812 (1956). While holding that there was no “taking,” this court noted that the operation of the aircraft, in landing and taking off, occurred at altitudes from 450 feet upward to 1500 feet, with a majority of flights above 1000 feet, and that the aircraft did not operate continually over the complaining village but only under particular weather conditions, making it impossible to be precise as to the number of flights over the village at any specific altitude. See generally Annot., 77 A.L.R.2d 1355 (1961).

69. 295 F.2d 936 (Ct. Cl. 1961). Plaintiffs herein sued for the value of the interest in said properties, allegedly taken as a result of aircrafts operating at Turner Air Force Base. B-25's made numerous flights at elevations as low as approximately 250-300 feet over all of plaintiffs' land; others flew as low as 100-150 feet. The Government defended on the basis that any cause of action accrued in 1941 and certainly no later than 1948-1949 when regular, low flights occurred over the land in question. Therefore, it was reasoned that the action should be barred by the statute of limitations. The issue presented was when did flights over the plaintiffs' lands amount to a taking under the standard established by the Causby decision.
Court of Claims, relying upon *Causby*, found that while there was some noise and inconvenience to the plaintiffs from the time the flights commenced in 1941, it was not so *obnoxious* as to be intolerable, and from 1947 to 1955 the effects of such flights were not such as to *interfere substantially* with the residential use of the plaintiffs' properties. It then went on to say:

It was not until late in 1954 or early in 1955 when the F-84F, a swept-wing aircraft, was introduced at the Base that the noise became intolerable to the plaintiffs. The noise created by the F-84F was different from the previous aircraft used in that it emitted a shrill, high-pitched, intense noise, terrifying to the plaintiffs. Furthermore, a number of KB29's were brought to the Base at the same time and they also made a very loud, and what was to plaintiffs, a terrifying noise as they flew over plaintiffs’ properties.\(^70\)

As with that portion cited above, the court throughout the opinion had difficulty in determining both the fact and/or time of taking.\(^71\) While it gave the impression that several factors were instrumental in the determination that there had been a "taking" at this time as opposed to some time in the past, in fact, the advent of the F-84F was the only determinative factor in the decision.\(^72\)

What is most surprising about this particular analysis was the relative ease with which the judges collated the various flights and the noise that each produced. In retrospect, it was not difficult for them to evaluate the forcefulness, irritability and obnoxiousness of each sound. Obviously, the noise emitted from the F-84F was of greater magnitude than the less sophisticated and less powerful aircraft that preceded it. But, what if that action were maintained in 1948 before the advent of the F-84F: Would the court have denied recovery?\(^73\)

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70. 295 F.2d at 938 (emphasis added).

71. It seems that this case points out an inherent difficulty of the *Causby* standard, in determining whether or when a taking has occurred.

72. The court did not dwell on the repeated occurrences versus isolated occurrence dichotomy. It merely was trying to find if there was direct and immediate interference.


Condemnation claims are subject to defending limitations, but in such a dynamic situation how should the period be measured? Assuming the complainants' use was prior to the airport, it may be argued that the limitation period commenced when the airport began operating. The question has real bite because the original airport activity may annoy owners of neighboring residences but not to a degree which impels them to seek relief.

... A related question — greater noise because of increased activity by the same type of aircraft — is still largely open, arising in issues involving the statute of limitations. Here courts have gone both ways. Some hold that once the airport...
Who is to say that 13 years from now, the sonic boom will or will not be considered obnoxious compared to the innovations of that day. Should we now compare the sonic boom with the noise that is produced by the F-84F?

In 1962 in *Batten v. United States* the question was raised in federal court as to whether a taking of property, compensable under the Fifth Amendment, could occur when there is no physical invasion of the affected property. Instead, in this case, the operation and maintenance of military jet aircraft on a United States Air Force Base produced noise, vibration, and smoke which interfered with the use and enjoyment of the land. In a most significant opinion, the court held that there could not be a “taking” primarily because there was no physical invasion. In essence the court held that there could be no liability imposed on the United States for noise, smoke, and vibration without physical invasion by direct overflight. The court went on to say:

The vibrations which cause the windows and dishes to rattle, the smoke which blows into the homes during the summer months when the wind is from the east, and the noise which interrupts ordinary home activities do interfere with the use and enjoyment by the plaintiffs of their properties. Such interference is not a taking. The damages are no more than a consequence of the operations of the Base and as said in *United States v. Willow River Power Co.* they “may be compensated by legislative authority, not by force of the Constitution alone.” As we see the case has begun operations, property owners are given notice not only of existing activity, but of greater future activity. Other decisions, at least implicitly, would not place any duty of foresight on property owners.

74. “But no court has yet been confronted with the question of whether the property owner, having recovered for interference caused by airport activity, may thereafter recover a second and perhaps third or fourth time for more interference where the cause is more aircraft of the same type.” *Id.* at 554.

75. 306 F.2d 580 (10th Cir. 1962).

76. The *Batten* court, in speaking of the repercussions flowing from the utilization of aircraft, stated that:

The mentioned activities produce sound and shock waves which cross the plaintiffs' properties and limit the use and enjoyment thereof. Strong vibrations cause windows and dishes to rattle. Loud noises frequently made conversation and the use of telephone, radio, and television facilities impossible and also interrupt sleep. 306 F. 2d at 582.

77. In discussing the meaning of the word “taking”, the court relied on United States v. General Motors Corp., 323 U.S. 373, 378 (1945), where it was said that governmental action short of occupancy was a “taking” if “its effects are so complete as to deprive the owner of all or most of his interest in the subject matter.”

78. Recovery has been allowed in the following cases because there was a physical invasion: Matson v. United States, 171 F. Supp. 283 (Ct. Cl. 1959); Highland Park, Inc. v. United States, 161 F. Supp. 597 (Ct. Cl. 1958); Herring v. United States, 162 F. Supp. 769 (Ct. Cl. 1958).

79. The noise and disturbances caused here were felt by the court to be mere neighborhood inconveniences, 306 F.2d at 585.
at bar, the distinctions which the Supreme Court has consistently made between “damages” and “taking” control and compel denial of recovery.80

Thus, in effect, the court required almost “total destruction” of the property interest.81

State Courts

While some federal district courts have taken the position that repeated flights nearby, but not directly overhead, must be endured as mere “damages” which for various reasons may not be compensable,82 the state courts have generally been much more lenient in this regard. In Thornburg v. Port of Portland,83 the court felt it was for the jury to decide whether systematic flights directly over or adjacent to private land, even though all flights were above the prescribed 500 foot altitude84 constituted a noise nuisance that was substantial enough to result in a “taking.” In not requiring physical invasion, and finding a taking where substantial diminution in property interest has occurred, the court agreed with Justice Murrah’s dissent in Batten. Moreover, according to this court it was felt that the majority view in Batten

80. 306 F.2d at 585. In United States v. Willow River Power Company, 324 U.S. 499, 510 (1945), the Supreme Court stated that: “Damage alone gives courts no power to require compensation.”

Also preserving the dichotomy of “damage,” and “taking” is Nunnally v. United States, 239 F.2d 521 (1956). See generally Gasiewiez, Aviation Easements, 8 A.F. JAG L. Rev. 38 (1966).

81. Justice Murrah, dissenting, however objected to such a requirement, asserting that a “taking” should only require substantial diminution, and not total destruction of the property interest. 306 F.2d at 587.


83. 233 Ore. 178, 376 P.2d 109 (1962). This was an “inverse condemnation” action brought by property owners against the owner and operator of an airport. From an adverse judgment below, the property owners appealed. The Port of Oakland owns and operates the Portland International Airport. Having the power of eminent domain, it had acquired property surrounding the airport but had stopped short of the complainants’ lands. The complainants alleged that there has been a “taking” in that noise from jets make their land unusable. The theories relied upon are: 1) Systematic flights directly over their land cause a substantial interference with use and enjoyment. Such an interference constitutes a nuisance. Such continuing nuisance, when maintained by the Government, amounts to the taking of an easement, or at least presents a jury question as to whether there is a taking; 2) Systematic flights, while not directly overhead, create a taking for the same reasons as above. The respondents contend that their planes were flying in the public domain, i.e., within the navigable airspace as defined by Federal law, and that there was no interference with any legally protected interest of the appellants and thus no taking for which compensation should be forthcoming.

84. The Thornburg decision strongly indicates that a property owner has a valid cause of action for a “taking” caused by overflights above 500 feet.
probably turned on considerations of public policy, i.e., that private rights must yield to public convenience in this class of cases.85

*Martin v. Port of Seattle*86 also rejected *Batten*. As stated in a recent periodical:

The trend today appears to reject *Batten* and accept a more liberal approach to granting relief in cases where there has been no direct overflight, but where noise and disturbance is of such a degree as to constitute a taking.87

The Florida state court of appeals, in accepting the legal theory of “inverse condemnation,” has recognized that noise interference alone may ripen into a nuisance which in turn could ripen into a taking. The court relied on *Thornburg* in reaching its decision.88

**REQUIREMENT OF A GOVERNMENTAL DEFENDANT**

In “inverse condemnation” actions courts are generally moving beyond the traditional “zones” of litigation — those areas adjacent to airports or within glide paths or approaches thereto. However, while such a zone is expanding, it has not yet reached areas any great distance away from a municipal or government airport’s provincial legal domain.89

There has also been a discernible broadening of the concept of the “proper party in interest.” For example, in *Ackerman v. Port of Seattle*,90 the court held that the continuing and frequent low flights over the claimants’ land constituted a “taking” of an easement for the purpose of flying airplanes over the land. It then had to decide whether the Port of Seattle, which operated no planes, could be held liable for the alleged “taking.” It said:

... the liability of the Port ... is predicated on the Port’s alleged failure to provide adequate facilities, necessitating the frequent low flights over the appellants’ land. Having the power

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85. 233 Ore. at 182.
86. 64 Wash. 2d 309, 391 P.2d 540 cert. denied, 374 U.S. 989 (1964).
87. See Note, supra note 4, at 173.
88. This court also said:
   Since U. S. v. Causby ..., and particularly since Griggs v. Allegheny County ..., we know that easements can be taken by repeated low-level flights over private land. Such easements have been found in actions against the federal government (*Causby*) and in actions against municipal corporation (*Griggs*). When such easements are said to have been taken, compensation must be paid to the owners of the land thus burdened.
   City of Jacksonville v. Schumann, 167 So. 2d 95, 99 (Fla. 1964).
89. We are speaking here of that zone within which a governmental entity can be sued for having performed a “taking”.
90. 55 Wash. 2d 400, 348 P.2d 664 (1960).
to acquire an approach way by condemnation, the Port allegedly failed to exercise that power, with the result that the appellants' private airspace is allegedly being used as an approach way, without just compensation first having been paid to them. Therefore, we conclude that in the instant case the appellants have not only successfully pleaded an unconstitutional taking, but further, they have alleged such a taking by the Port.  

Following and augmenting the Ackerman decision, the Supreme Court handed down an opinion in the case of Griggs v. Allegheny County. There the Court imposed liability for an invasion of airspace upon the condemning authority operating the airport rather than upon the federal government or airline companies actually operating the planes. In so doing, the Court stated:

It is argued that though there was a "taking," someone other than respondent was the taker—the airlines or the C.A.A. acting as an authorized representative of the United States. We think, however, that respondent, which was the promoter, owner, and lessor of the airport, was in these circumstances the one who took the air easement in the constitutional sense.

Justice Black, joined by Justice Frankfurter, argued, in dissent, that the federal government, not the county, had taken airspace over the claimants' property. The underlying rationale, therefore, was that since the federal government was the entity which appropriated the airspace easement, it should consequently be held liable for the diminution in property value. The majority of the Court in deciding that the federal government was not the taker, went on to say that:

Respondent decided, subject to the approval of the C.A.A., where the airport would be built, what runways it would need, their direction and length, and what land and navigational easements would be needed. The federal government takes nothing; it is the local authority which decides to build an airport vel non, and where it is to be located.

However, in Wright v. United States, a circuit court of appeals indicated that the United States Government was liable for acts of a

91. 55 Wash. 2d at 413, 348 P.2d at 671; accord, Martin v. Port of Seattle, supra note 87.
93. Id. at 89 (emphasis added).
94. Id. In Cheskov v. Port of Seattle, 55 Wash. 2d 416, 348 P.2d 673 (1960), although the question was not presented, the court recognized that an owner of an airport, having the power of eminent domain and the duty to provide adequate facilities to carry out normal airport operations, could be liable for invasions of legally protected interests of landowners.
95. 279 F.2d 517 (1960).
state national guard unit since the facts indicated that the United States had taken a flight easement, thus permitting the guard unit to continue its use.

These decisions are particularly pertinent in forecasting the dispositions of future "inverse condemnation" proceedings. For, if we say that the substantial amount of sonic boom damage occurs in areas away from air stations, and that it is likely that commercial airlines will initiate supersonic jet transport of passengers and cargo, it is necessary to ascertain a governmental unit or body empowered to effectuate a "taking" of property by eminent domain before any "inverse condemnation" action can be successfully maintained.

THE EFFECT OF SONIC BOOM ON THE THEORY OF INVERSE CONDEMNATION

Within the framework of the fifth amendment of the United States Constitution, wherein the theory of "inverse condemnation" is founded, the current posture of the law is somewhat unsettled. As to whether or not there has been a "taking," two basic factors must be considered: what kind of damage, and how great a degree.

First, pursuant to Causby, which is still good law, the Supreme Court was not so much concerned about the dollar amounts of damage or the actual physical manifestations as it was about the real effect upon the complainants' use and quiet enjoyment of their land, as those terms had been used in prior decisions relating to similar subject matter. Thus, landowners would not be precluded from maintaining an action in "inverse condemnation" so long as the essential elements of the cause of action had been met.

The federal circuit court in Batten was similarly not influenced by the manifold kinds or forms of damage the landowners had sustained. It would obviously be irrelevant whether an oppressed claimant

96. See generally Apothaker, supra note 27. With regard to military aircraft and damage allegedly caused by a sonic boom, claims pursuant thereto are generally administered under the Military Claims Act. Thus, if it is established that the damage was caused by an Air Force or Navy created sonic boom, the individual would be reimbursed for the amount of his substantiated damages. However, Mr. Apothaker points out:

Damage, within the meaning of the Military Claims Act, is interpreted to mean actual "physical" damage. Claims for compensation for alleged "taking" of property (navigation easement or depreciation in the value of the property) resulting from jet operations in the airspace over private real property are not considered cognizable under the provisions of the act. The position of the Department of Defense is that the settlement of such claims is a matter for the courts to determine. Id. at 987 n.3. See also Highland Park, Inc. v. United States, 161 F. Supp. 597 (1958).

97. See generally Udall Report, supra note 1, at 44.
sustained glass damage, plaster cracks, or rattling and shaking of small tangible items.

Unlike traditional factual situations, in "inverse condemnation" litigation dealing with subsonic aircraft noise and its effects, supersonic transports and their potential damages present many new problems requiring judicial recognition and resolution. A typical problem is harassment to the landowner in remote geographical areas. The courts must now concern themselves with vast land masses between airports and terminals, aircraft flying higher than permissible safe altitudes, and sonic boom and other effects of at least equal or possibly greater magnitude. Standards developed for subsonic transports flying in similar areas at altitudes that would in no way interfere with the use and enjoyment of land and would not be legally construed as constituting a compensable "taking," must not control in the case of the supersonic transport. For what could have been considered as a safe altitude, for evidentiary purposes, prior to the SST, may now be an extreme hazard to the landowner. Accordingly, most courts, while they have not yet been confronted with regular supersonic flight situations on a commercial or military basis, have abandoned the requirement for liability that aircrafts be flying outside the navigable airspace as delineated by federal regulatory agencies or other governmental bodies. This effectively has eliminated the absolute defense of compliance with altitude requirements.98

The Supreme Court, in Griggs, and state courts, as evidenced by the Thornburg decision, have also liberalized the requirement that there be a direct overflight above the plaintiff-landowner's property. Instead, adjacent flights, which are by definition outside of the landowner's physical boundaries, can give rise to a proper "inverse condemnation" action. The court in Batten, however, obdurately adhered to the necessity that there be a direct overflight. But, the SST was not involved in that case, and the widespread physical repercussions in terms of geographic area were therefore not in question.

The SST, although not flying directly over a claimant's property, may through tremendous noise and vibration, fumes, and increased traffic, deprive surrounding property owners of the use of their land. Thus, although Batten has not been expressly overruled — these new factual developments seem to be sufficient to reverse such myopic

98. State courts are generally more concerned with the damaging repercussions that spring from the use of the aircraft than with the location of the plane. Specifically, courts in Washington, Oregon and Florida for example, do not exact the over-flight requirement. In those states it suffices that the flights are low enough, whether or not overhead, to interfere substantially with the complainants' use and enjoyment of property. See Martin v. Port of Seattle, supra note 86; Thornburg v. Port of Portland, supra note 7; City of Jacksonville v. Schumann, supra note 7.
reliance upon direct overflights. Consequently, it is this writer’s opinion that future courts will argue, assuming the commercial or military SST comes into being, that the supersonic transport is so foreign to its antecedents, that it warrants a decided shift in position.99

Second, the Supreme Court, in Causby, took a most pragmatic approach with regard to the degree of interference required. It was willing to look closely at the facts at bar to determine whether they constituted an immediate interference with the use and enjoyment of the land. The state courts as well, by applying tests of “substantial interference,” deprivation of “use and enjoyment,” “nuisance ripening into a taking,” etc., have come, with case by case analysis, to the same result. Again, however, the Batten court assumed a position of rigidity by demanding that there be such substantial interference as to constitute almost a total despoliation of use.

It is submitted that the degree of interference created by the SST will be considerable. The proposed United States SST, will be an 1800 mile-per-hour craft, with an average boom pressure of 2–2.5 pounds a square foot of pressure.100 Although recent test results have indicated that widespread damage from the SST’s sonic boom is not imminent, even if the aircraft were to make repeated flights over domestic land areas, it seems questionable whether supersonic aircraft flying at Mach 3 speeds, or in excess thereof, will be similarly unharmful.101 In addition, since the strength of the boom will increase when atmospheric conditions change and when the aircraft assumes varying cruise and lift patterns, it is likely that ground effects will intensify as well. Professor H. S. Ribner of the Institute for Aerospace Studies at the University of Toronto has said that “jet pilots, by maneuvering at low altitudes could intensify the sonic boom by up to 20 times.”102 This was corroborated somewhat by the fact that glass windows were recently broken by the sonic bang of low flying Israeli and Syrian fighter planes.103

99. State courts have moved toward abolition of the stringent majority view posited by Batten. There will undoubtedly be an escalation of case law before either theory espoused in Batten will be firmly accepted or advanced, especially if widespread usage of supersonic transport becomes a reality. But, if the nuisance theory is ultimately adopted across the board without the requirement that there be a physical trespass, the original concepts advocates in Causby may be broadened to an extent not anticipated by the courts.

100. N.Y. Times, February 4, 1970, at 86, col. 5. This “pressure” represents that which is added to the existing pressure at sea level. See Wash. Post, April 27, 1969, at E-16, col. 1.


103. NEWSWEEK, Feb. 9, 1970, at 41.
"While it is possible to describe sonic boom measurements in terms of decibels, the figures would not be meaningful since acoustical instrumentation calibrated to the decibel scale is not designed to measure short duration pressure pulses."\textsuperscript{104} Nonetheless, it is generally conceded that noise levels emanating from the SST are intense and extremely annoying.\textsuperscript{105} For example, the same 1800 mile-per-hour craft alluded to previously would create noise equivalent to that made by a subsonic jet flying 100 feet overhead.\textsuperscript{106} Moreover, the swath, or noise configuration in terms of linear ground distance, as mentioned before, is considerable.

Treatises and scientific journals have discussed the dichotomy of "sonic boom" and "explosion" and of the difficulties of distinguishing between them.\textsuperscript{107} On that basis, they have asserted that through extrapolation the effects of sonic boom, like explosion, should result in a "taking" within most of the legal doctrinal frameworks heretofore suggested.

As \textit{Griggs} and others in that line of cases strongly intimate, a governmental entity can be delineated as that body which has constructively acquired property by eminent domain. For by authorizing supersonic transport flights over land, appropriating funds therefor, and by implementing the particular legislation giving rise thereto, the federal government will \textit{become} the proper party–defendant in an action in "inverse condemnation." Specifically, by allowing commercial airlines to introduce supersonic passenger planes, the regulatory measure providing therefor may be construed as being the creation of an easement which can ripen into a "taking" of property pursuant to the eminent domain clause of the United States Constitution. Moreover, damage resulting from the sonic boom, being foreseeable, would be wholly connected with the object and activity of the governmental program and would be at least an outgrowth of the regulatory measure. Thus, "inverse condemnation" could be invoked successfully by a private landowner as a basis for relief from damage caused by sonic boom even though the aircraft in question are not governmentally owned.

Ostensibly, production of the SST is being advocated by the Nixon Administration on the basis that it will provide for a beneficial

\textsuperscript{104} Letter to Mr. Jerome N. Kline from Mr. John D. Demeter, Special Assistant for the SST, Department of Transportation, Federal Aviation Administration, February 6, 1970. (hereinafter cited as \textit{Demeter Letter}).

\textsuperscript{105} See generally Hill, supra note 101.

\textsuperscript{106} N.Y. Times, February 4, 1970, at 86, col. 5.

\textsuperscript{107} See Hammon, supra note 23.
public purpose. Specifically, three major arguments in favor of the SST seem to predominate. First, it is thought that supersonic transport will greatly stimulate economic growth. Second, it will provide incomparable convenience to individuals in their geographic mobility — as well as to society in the movement of goods. Third, it will place the United States firmly in international competition, thereby greatly enhancing the materialistic prestige of our country.

In fact, the SST will be a boon to defense contractors, to the airline industry, to manufacturers of constituent parts, and to big business in general. Nonetheless, in the final analysis and within the ambit of the Fifth Amendment, such development will be undoubtedly for a "public purpose."

THE EFFECT OF INVERSE CONDEMNATION ON DEVELOPMENT OF THE SST

The sonic boom, if it is to have a permanent presence in our already strident society, will present even more unforeseeable problems than those that have arisen to date with regard to noise, general annoyance, and property damage. Perhaps it is best phrased as follows:

Studies of public reaction to aircraft and other extreme noises in the United States, France and Britain, have consistently shown that when frequency and intensity of noise exceed certain measurable indices, many people consider the noise so objectionable that they resort to protest, to political pressures, to legal procedures and to other active (and costly) measures in efforts to achieve relief. Regular overland commercial flights of SST's over the continental United States as projected, would engender intensities and frequencies of sonic booms exceeding these indices over large areas of the country, inhabited by tens of millions of people. The negative public reaction, which can be predicted from the studies already made, would be exceedingly large.\textsuperscript{108}

In asserting and perhaps retaining his jurisdiction over the atmosphere above his land, the individual should have recourse to "inverse condemnation" actions which in effect would align him with those courts which already preserve that area above his land that he can properly occupy and use.\textsuperscript{109} Furthermore, "inverse condemnation"

\textsuperscript{108} Udall Report, \textit{supra} note 1, at 4.

\textsuperscript{109} Courts have contrasted private and public rights. With regard to private rights an invasion of air space above land is commonly said to be an invasion of a landowner's right of possession and quiet enjoyment. And with regard to the public right, there exists on behalf of any citizen in the United States a public right of freedom of transit in air commerce through the navigable airspace of the United States. See Note, A Study of the Development And Current Status in Georgia of
can and should be utilized as a means of preventing arbitrary land use regulation\textsuperscript{110} and a general usurpation of private interests.\textsuperscript{111}

Supersonic transport development will create costs far beyond traditional amounts of appropriated funds or out of pocket expenditures normally incurred by the federal government or private airlines in common air transport. In fact, costs are so high that commercial airlines have lobbied and pressured the federal government to assume the major burden of such costs.

The underlying social rationale for the maintenance of actions in "inverse condemnation" is that of barring Government from forcing some people to bear public burdens which in all fairness and justice, should be borne by the public as a whole. Such a rationale should be considered in the light of the effects of the sonic boom. Damage payments, as a result of "inverse condemnation" claims successfully raised, will immensely add to total costs of development. These additional costs may make the fabrication of a prototype and full-scale production of the SST economically unjustifiable. The expense of development, with the additional deterrent of the "inverse condemnation" action, seem to greatly overbalance the effects of international prestige and other general arguments of the SST's proponents. Consequently, its development at this time seemingly is not desirable.

**Recommendations**

A solution to the problem of governmental liability for sonic boom damage calls for a balancing of the public interest in national defense, rapid transit, and technological development, against the interest of the individual citizen in receiving compensation for just claims. While we should not deter the public sector from engaging in public activity, we should also not easily allow a private owner's land to be taken for such public activity to his detriment.

There has been a plethora of congressional action dealing with problems of air transportation. Such action has emanated from the dual desires of minimizing the hazards of air navigation and protecting the private land owners from the burdens and annoyances accompanying the advent of technological advancement in air transportation.

Currently, in the legislative process, there are conflicts among trade associations representing aviation interests, the Federal Com-

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\textsuperscript{111} See Beuscher, \textit{ supra note 13.}
munications Commission, the Federal Aviation Agency, and other special interest groups. In making findings and recommendations, it should be required of those involved in the policy and decision making processes to give due consideration not only to the views and ideas of the Department of Defense, the Federal Aviation Agency, the Department of Transportation, and any other agencies and special interest groups, but to the opinions and considerations of responsible citizens. The effects upon our environment should be an integral part of this analysis.

Since the courts have necessarily become involved in a reconciliation of conflicts that have arisen, perhaps they should be the ones to help extricate us from a somewhat troublesome situation. If so, it is this writer's feeling that the judicial system should adhere to more uniform standards and set up guidelines so that all persons, institutions, and governments know the boundaries of permissible activity. Moreover, they should adjust their determinations to more equitably distribute the obvious burdens that will inevitably arise with supersonic flight.112

Finally if the federal government is to permit the SST to fly without stringent restrictions, it must be prepared, as must congressional constituents, to pay therefor by way of taxing impositions, economic repercussions and aesthetic burdens.

In the final analysis, Congress should make the "Go-NoGo" decision after a lengthy and in depth study of all the factors previously alluded to. Otherwise an unfair burden remains with the courts. Congress should not blindly approve the SST and rely on the judiciary to remedy any inequities arising therefrom.113 Hopefully, the congressional decision will be "NoGo."

CONCLUSION

Although actual physical damage due to sonic boom is not subject to exact determination because manifestations will differ according to varying circumstances, effects generally are comparable to subsonic

112. See Haar, supra note 73, at 556.

113. Mr. Justice Black, in his dissent in Causby, lucidly foresaw the problems confronting the courts in this area:

The noise of newer, larger, and more powerful planes may grow louder and louder and disturb people more and more. But the solution of the problems precipitated by these technological advances and new ways of living cannot come about through the application of rigid constitutional restraints formulated and enforced by the courts. What adjustments may have to be made, only the future can reveal. It seems certain, however, that courts do not possess the techniques or the personnel to consider and act upon the complex combinations of factors entering into the problems. 328 U.S. at 274-75.
aircraft in the vicinity of municipal airports. Assuming iterative commercial transcontinental flight, landowners over a wide terrain will be subject to loud noise, property damage, speculative health hazards, and a general loss of the use and enjoyment of their land. Depending on location, their real property holdings will sustain a loss in value, and their bundle of property rights in the main will decimate.

The executive branch of our federal government has adduced a myriad of factors supporting development of the SST. It has asserted that this impending endeavor will endear the American people to its public cause. Its domestic and international implications have been stressed, and the call has gone out to Congress to reincarnate a recently dormant political issue. It is this writer's opinion that the call should not be heeded, and that no federal governmental decision to proceed with the SST should be implemented; "nor shall private property be taken for public use, without just compensation."