A Site Constructed:
The Bonneville Salt Flats and the Land Speed Record, 1935-1970

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OUTLINE

From its modest folk beginnings in the late 1890s to the most recent attempts at over 760 mph, the chase for the land speed record has captured the public imagination. Unlike typical races, in which individuals compete against one another on a specific course, records are always understood to be temporary conditions – measures to be surpassed, in this case, often by the very same driver who had set the earlier mark. In this chase for time, perfection is an elusive (if not somewhat absurd) goal. While early record-setting vehicles were simply the most sophisticated in the automotive field at the time – sporting competing technologies like electrical, steam-powered, or combustion engines, and driven by the most competent drivers of the day-, such cars quickly proved insufficient given the growing ambitions of new drivers and engineers: beginning in the 1920s, new vehicles were being conceived *specifically* with the goal of breaking the land speed record, and quickly stopped looking like cars altogether. Borrowing from powerful propulsion technologies developed in aviation and rocket design (their shaping similarly inspired to the point of looking perhaps more like jet airplanes with their wings cropped off, lacking steering ability and traditional break systems), the *land* on which such vehicles would speed on rapidly became indeed a rather conceptual proposition.

With the desire for ever greater speeds came a need to find better terrains to test these vehicles. Speed runs require vast expanses of perfectly flat, unobstructed space – literally stretches of land several miles in both length and width to accommodate for the vehicle's acceleration, deceleration, and potential deviation off course which, at such speeds, could be fatal. Unlike typical roads, the requirements for such surfaces, as defined by rapidly developing cars, became far too large to be built by hand. Beginning with the natural sands of beaches such as Daytona, and later shifting to the Bonneville Salt Flats in Utah, a tradition emerged of finding natural sites suitable for such endeavors. Bonneville reflects the golden age of the chase for the land speed record. With its perfectly flat elevation across distances so great that the curvature of the earth becomes visible to the naked eye, the flats constitute a benchmark of sorts in speed racing, and for 35 years attracted the best drivers and their crews to compete there. Bonneville saw the speed record being broken no less than 18 times between 1935 and 1970, with final speeds literally *doubling* the initial record of 301 mph set there by Sir Malcolm Campbell in 1935. The American would set numerous other records on the flats, with a maximum speed of 600.6mph in 1965.

This paper will explore the way in which the salt flats of Bonneville, on the edge of the Great Salt Lake – an inhospitable landscape well known as early as the 1850s to westbound

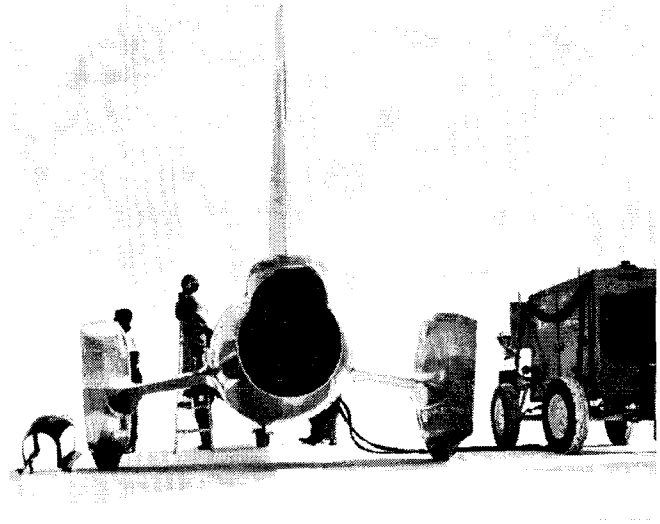

Fig. 1. In 1963, Craig Breedlove raced his Spirit of America *on the way to an unofficial (because the vehicle lacked a fourth wheel) land speed record of 407mph.*

Fig. 2. Site map. On the flats, summer 2002. Photograph by the author.

settlers traveling to California – was reinvented as a racing site and later mapped through ever-increasing measures of speed. The paper discusses the idea of record as measure, as a means to both occupy and construct this site. While it could be argued that this landscape was chosen in a sense for its lack of impact on the performance of these race cars (because of its flat, smooth, unobstructed terrain), these qualities – a sort of idealization of the site for such pursuits – and the achievements they enabled, are precisely what allow the extraordinary character of the site to be revealed.

The paper will argue that the program of racing is in fact a sort of idealization of the site and its particular resources, and that consequently the activities of racing and the events of record-setting are in fact entirely connected to a greater sense of the landscape in both space and time. It is through racing on the site that is revealed an exceptional record of human activity.

SITE AND ORIENTATION: APPROACH NARRATIVE

A single road leads to the flats. This 3 mile stretch of asphalt, branching off North from Interstate 80 a few miles East of the small town of Wendover, ends rather abruptly: ahead there is nothing but a white salt, framed to one side by large, monolithic mountains far away in the background. Standing at the end of this road, which bulges slightly from its standard 2 lane width to accommodate a modest parking surface, one stares into open space as if at the end of a pier jetting into the ocean. The asphalt grade, raised only a few feet above the natural ground surface, eases gently down to the salt as if it were inviting cars onto it.

Stepping onto the flats, a sense of distance becomes impossible to establish. The mountains in the background to the East and North (such as Floating Island – whose very name is a reference to the fact that the flats were once part of Lake Bonneville, which encompassed the Great Salt Lake and an area 4 times its size) could be 10, 20, or 40 miles away. The landscape is silent. Time seems to have stopped. The whiteness of the ground cover suggests a snow or ice-covered landscape: our visual senses tell us this should be winter – if it weren't for the scorching summer heat.

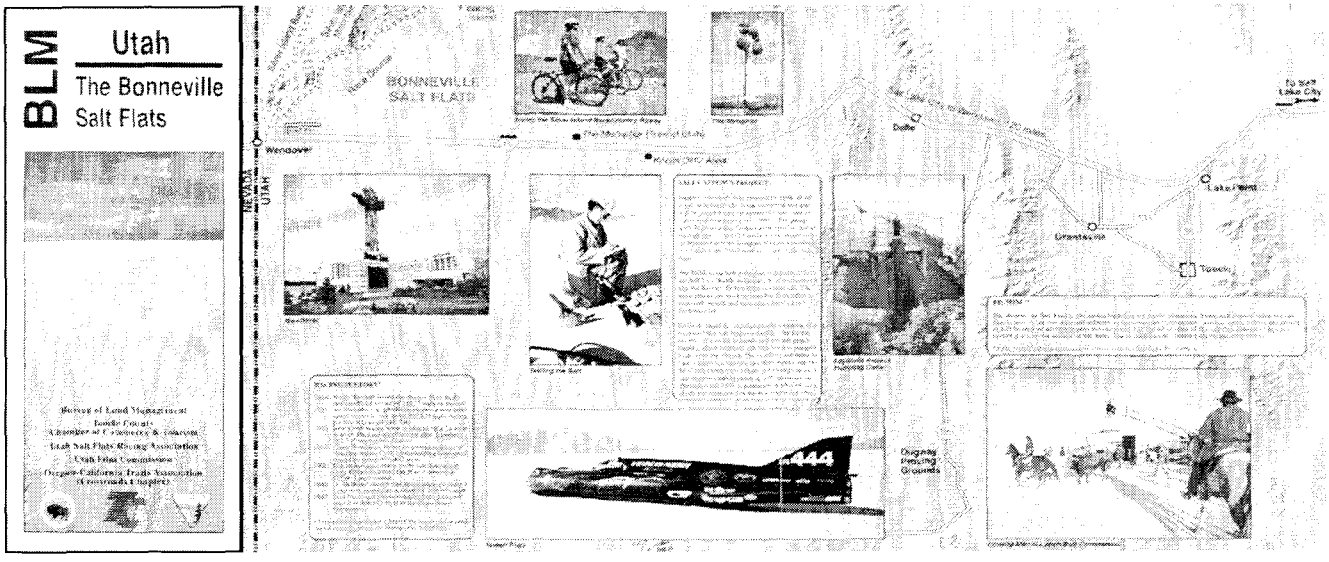

Fig. 3. Bureau of Land Management (BLM) map of the Bonneville Salt Flats in Western Utah. Note how the city of Wendover sits in the left margin of the map on the Utah / Nevada border.

A slight thickening of the horizon to the South reveals the shored up grade of the Interstate in the distance. Cars move upon it like waves. My companion on this visit is ahead by a few hundred feet. She is floating ungrounded in the distance, her figure cutting against the horizon. Her shadow lies ahead of her – it is not visible to me from where I stand. I assume that her feet touch the ground, but I lack the visual references to clearly establish this fact. Because it is everywhere in sight the ground becomes so abstract as to disappear concretely from view. It comes to life as an occasional meeting between bodies traveling about the place and their respective shadows.

Between our eyes and our feet (between the horizon line and the ground line) lies a band of white salt, undisturbed in its flatness, so impeccably smooth that no reading of its scale is possible. The landscape literally exists as a single line – the horizon –, so abstract in its linearity that we struggle to find a way to rationalize the space before our eyes, this perspectival abstraction, this limitless territory. The expanse of sky enclosing the landscape in the distance suggests Lewis Carroll's map of the sea as an empty box marked only by a strong exterior frame – as if the landscape were an vast, four-sided room framed vertically by the sky. The horizon is not a fixed place: it is a relative marker that moves with us, giving us a sense of an unchanging landscape, even as we progress through it in time. This limit of space remains constantly in our eye, never any closer to our feet.

SITE, ORIENTATION, PASSAGE: CONSTRUCTING MEASURES OF DIFFERENCE

Perhaps it is by establishing difference within this undifferentiated terrain (constructing alternate horizons, or intersecting lines of reference, so to speak) that we begin to understand our place within this landscape. The site is revealed in subtle, considered measures: the horizon, for example, constitutes the dominant landmark in the landscape – a conceptual limit marking the meeting of the earth and sky. Similarly, we search

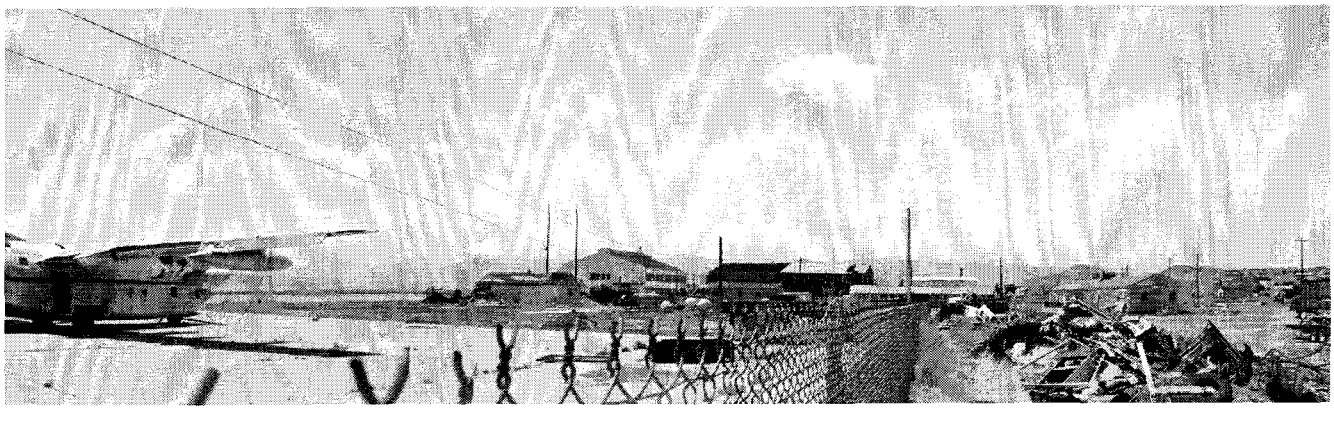

Fig. 4. Wendover Air Force Base, Wendover, Utah, summer 2002. Photograph by the author.

for shadows as evidence of the ground. With patience, time might be revealed to us as the slow and predictable movement of such shadows, cast by perfectly immobile bodies.

The recent record of human occupation on the flats – understood as a particular means to construct such difference – translates into an veritable infrastructure of transition, some resulting in permanent acts of building, others in ephemeral passages no less firmly anchored in the history of the region (best known perhaps is the tragic fate of the Donner-Reed party traveling west on the flats towards California in the 1850s). Utah witnessed the wedding of the wires and is the site of the Golden Spike Monument, places marking for the first time respectively continuous routes of telecommunication and train travel across the country. Locally, the city of Wendover, on the western edge of the flats, singularly owes its existence to the presence to the railroad – it was planned as a water station for passing trains (water was not actually present on the site; rather, it was artificially pipelined from nearby Pilot Peak down to the desert floor). Similarly, the decision to run an Interstate through Wendover and the flats to the West and South of the Great Salt Lake in the 1920s was not finalized until alternate routes were considered: ironically, the Victory Highway route – the current I-80 – won favor over the Lincoln Highway proposal simply because it was shorter; for its inauguration, local driver Ab Jenkins raced a passenger train across the flats to prove the efficiency of highway travel. The landscape is also bisected by the Utah-Nevada state line, visually marking the meeting within the city of Wendover itself of 2 conflicting cultures and ideologies, the former conservative and religious, the latter liberal and open.

With the exception of this infrastructure of passage, the landscape seems to have resisted the accumulation of solid residues of meaningful, permanent forms of settlement: in Wendover remains the ghost of an abandoned Air Force base, upon which thousands of military personnel converged during World War II to support the Enola Gay and its crew on a mission that would bring the atomic bomb to Japan and seal the fate of the hostilities. Its hangars and impressive landing strip now lay abandoned – a monumental and desolate background to the city. The border casinos located on the Nevada side of Wendover are filled with cars sporting Utah plates – a case of Utahans ironically placing unacknowledged cultural residues of Mormon culture comfortably *out of view*, literally on the *other* side of the state line. Few live in Wendover whose lives are not connected in some way to the gambling activity.

INTENSIFYING THE IDEA OF PASSAGE: SPEED AND RECORD AS MEASURES OF DIFFERENCE

The notion of racing on the flats for the land speed record over the past 75 years constitutes an extreme intensification of these narratives of passage and transition. Embedded in the concepts of speed and record is a desire for difference: speed is inherently a indication of difference, measuring change in both time and space. It is perhaps ironic that measures of land speed on the flats are timed to the thousandth of a second in a landscape that has literally remained physically unchanged in the last 10,000 years (the mountains in the background serve as an index of the various water levels of Lake Bonneville over the site), and that out of such timelessness could emerge such a desire for precision. Similarly, embedded in this notion of record is an index of difference and fluctuation marking improvement: while it is absolute, a record is not a permanent measure but is rather a benchmark to be surpassed, a measure to be challenged. In setting a record, another record is inevitably always broken.

Embedded in the idea of record is another important consideration related to site: a recording is an active process, and thus represents human engagement with the site. Records constitute memories which speak of previous occupations, and in recalling these is revealed the emergence of tradition and continuity. This paper argues that speed, record-breaking and record-ing constitute in fact the very means by which difference (and consequently identity) is constructed in this landscape. If top speeds achieved on the site at over 600mph suggest anything, this is indeed an extraordinary identity – something clearly outside of ordinary human experience. Of particular interest in this paper are the subtle conflicts and mediations that emerge between the activities surrounding the pursuit of the land speed record and the inherent resistance of the landscape to change. It is in recognizing the potential of the flats as a natural surface to race on that a mutually beneficial relationship between technology, human ambition, and a deep respect for the landscape and its geology, is forged. In this sense, the cars and people that occupy the landscape become as much an integral part of the site as the landscape itself.

It is not surprising then that attempts at the land speed record have inevitably set in motion significant human capital and energies across the flats: racing officials and institutions coming to witness the attempts, Bureau of Land Management crews employed annually to construct and maintain the course itself, drivers and their own crews, reporters, as well as the general viewing public – all converged on the flats in anticipation of the potential events about to unfold, each providing a different kind of account of the event as well. Particular racing seasons on the flats (2 in particular come to mind: 1938 opposing John Cobb and George Eyston; 1964 with Walt Afrons, Art Afrons, Craig Breedlove, etc . . .) opposed a series of teams to one another week after week, so that the record barely stood for more than a few days at a time. It would not be unusual for one crew or team to want to respond to a new record by trying to set a new mark of its own.

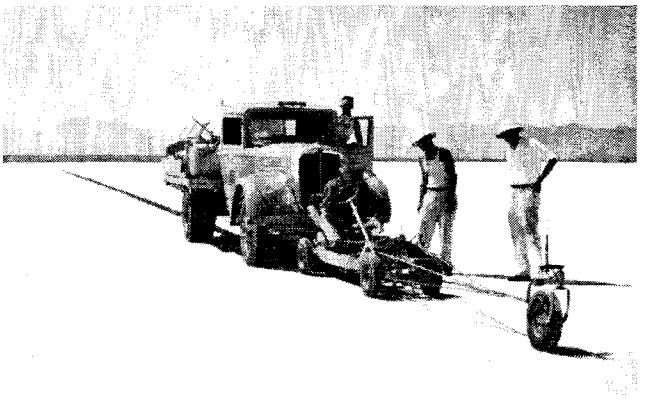

Fig. 5. Tracing the oil lines delineating the race course. Methods have changed little since the practice began in 1935.

RECORD AS ABSOLUTE MEASURE: STANDARDS, PROCEDURES

When Teddy Tetzlaff first raced his Blitzen Benz across the flats in pursuit of an (unofficial) speed record in 1914, the general public was invited to participate in the event not only as visual witnesses but also by timing the race itself to determine the driver's speed. Predictably, this process did not produce results of great consistency. While there have been several other unofficial/unverified attempts that have passed into lore (Henry Ford held an American land speed record for a few weeks in 1904, but it was never recognized by European authorities at the time; Mickey Thompson's single ride over the flats at over 400mph in 1960), a record suggests, by definition, absolute authority in the matter: the land speed record marks the fastest among the fastest – a record among measures.

This singularity of purpose conceptualizes an ideal of speed (the fastest *ever, anywhere*), and the need for a high degree of scrutiny with regard to the way these speeds are measured. Such procedures completely subvert any notion of specificity in the landscape and neutralizes the concept of the ground as a surface. As cars approached the 300 mph mark in the early 1930s, record-setting terrains could only be terrains that played absolutely no disadvantage in the process. As early as 1910, the roads on which we *now* drive cars every day would have proven unsatisfactory for record attempts of the time. Furthermore, the idea of terrain as it was invented by increasing speeds had to be universal – as the record was – in its appeal.

BONNEVILLE AS AN IDEALIZATION OF RECORD PROCEDURES: OUTCLASSING DAYTONA

In the late 1890s, an authority was established in Europe to ensure consistency of results surrounding attempts at the record: the *Automobile Club de France* shouldered responsibility for defining most standards and procedures that are still in effect today. Beginning with Chasseloup-Laubat, who is credited with the first automobile speed record (39 mph in 1898), it

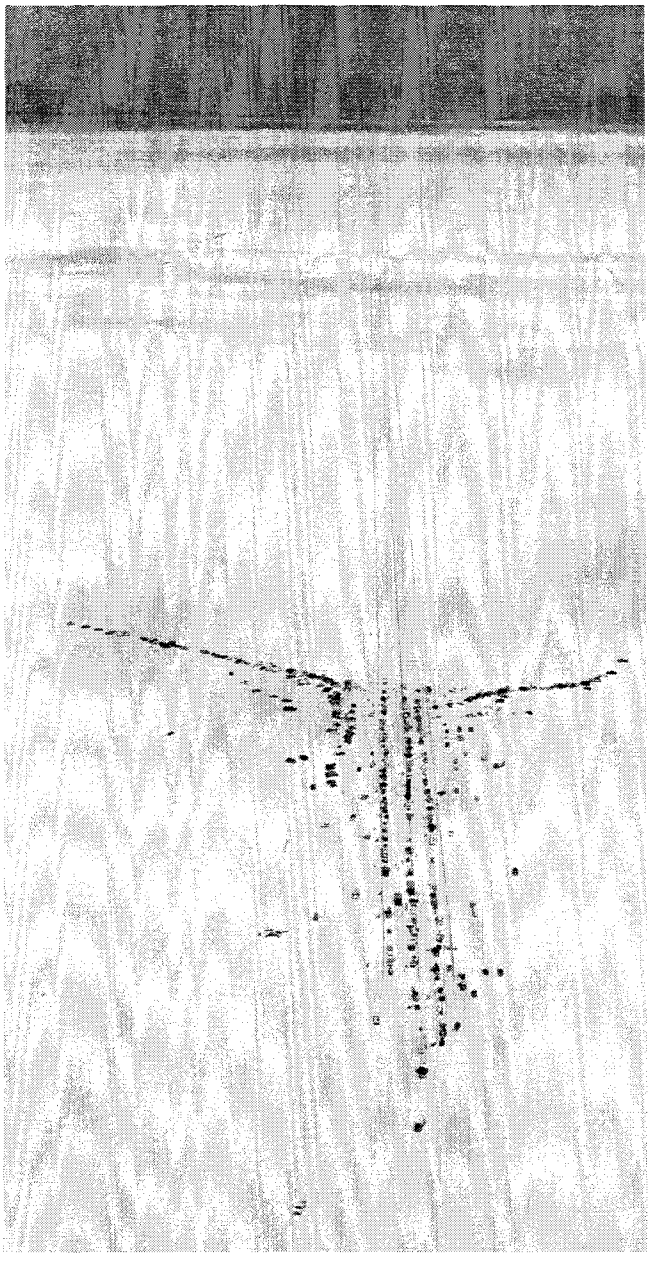

Fig. 6. Aerial view of the site. In addition to individual bids for the ultimate land speed record, the flats have each year since 1948 hosted a number of open racing events.

has long been a tradition that speed races take place over a course known as the *flying mile*. Because cars enter this course at full velocity (rather than from a standstill), the flying mile privileges pure speed (and the ability to maintain these speeds over a certain distance), rather than acceleration or even driving skills across complex terrains. Timing gates at both ends of the course measure the time required to cross the distance, and an average speed is computed. Long stretches of track several miles in length flank the flying mile course for acceleration and deceleration. The spacing of the gates privileges a sense of driving between the 2 points in the shortest way possible – a line: Ab Jenkins first gave form to this idea in 1935 by tracing

an oil line path on the salts of Bonneville for drivers to use as a reference: if they could no longer see the exiting gate ahead, they could simply follow the line in front of them. Beginning in 1911 at the urging of the A.I.A.C.R. (*Association Internationale des Clubs Automobiles Clubs*), any official attempt could no longer be a single run but rather the mean speed average of 2 consecutive runs, in each direction of the course, within a window of time of one hour. This ensured that no advantage might be taken of natural conditions on the site over a fairly limited window of time (wind, etc..), thus making a course – which could only present slopes of less than 1% to begin with – even straighter and true. A final mean speed, *averaged* from both attempts, would stand as the true measure of achievement.

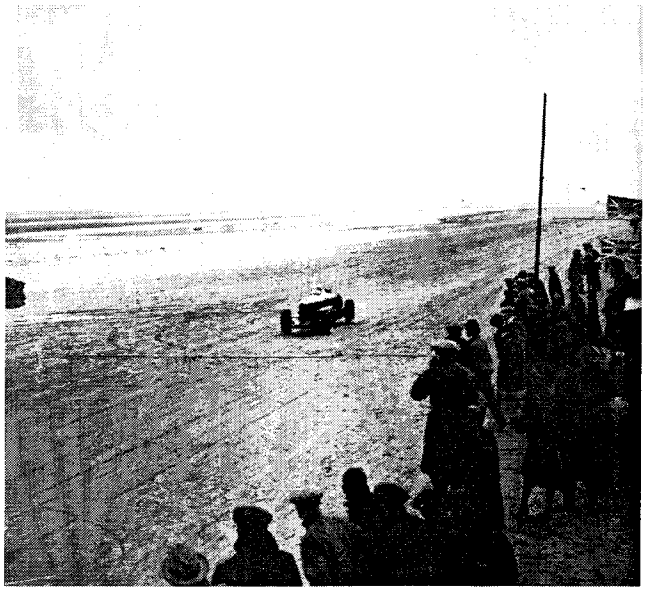

Fig. 7. Racing for the land speed record on the beaches at Southport, England, in 1926.

The flatness of elevation, the linearity of the course, the elimination of natural advantages – all these factors conceptually neutralize the local characteristics of the landscape. Given their absolute authority in matters of speed, such records are inherently not local. Rather, they present a universal measure of accomplishment, and consequently, measure the land (the role of the land) in a highly specific way as well. It could be argued that underlying the quest for the land speed record is also a quest for the vastest, flattest, longest, smoothest (and most accessible) ground condition possible. As generic as this notion of landscape was suggested to be, as speeds grew the number of possible venues to race one would become fewer as well. Could a specific terrain in a specific location hold an advantage over another, that is, by *not-affecting* performances in a negative way?

The continued success of the Bonneville Salt Flats as a racing venue starting in the 1930s constitutes in itself a measure of how closely the site conditions matched the expectations of the role the land itself was to play in setting the record. Championed by local Utahans Bill Rishel and Ab Jenkins (himself the holder of several endurance records on the flats) as a racing venue in the mid 1910s, the salt flats cemented their reputation as the ultimate speed course after Sir Malcolm Campbell first established an official land speed record there at slightly over 300 mph in 1935. Campbell had already held several land speed records in the past (mostly racing against himself between 1931 and 1935, trying to beat his own record, as it were), driving a series of custom designed and engineered cars which, already at this time, were employing airplane engines as means of propulsion.

As he had done in the past, Campbell had intended to test his newest *Bluebird* on the beaches of Daytona, Florida – the racing standard in the speed community at the time. Daytona was the first track where a strong tradition of attempts for the land speed record had developed – overseeing, between 1928 and 1935, 8 new records being set –, in the process literally outclassing in attempts the combined record of all other similar tracks around the world (Pendine and others in Europe) at the time. It was around 1900 that beaches had become favored racing sites over local roads because of their length, smoothness, and relative accessibility. The distances required for such tracks quickly had quickly made building racetracks an economically improbable situation, and beaches combined the expanse of land and smoothness of terrain required for these kinds of attempts. Cars like Campbell's required between 7 and 10 miles of track to attain maximum speeds before entering the flying mile course. In a sense, this growing need for length literally "invented" beaches as racing venues. As with Bonneville, it is through a sustained record of human activity and not through building of permanent physical structures that the Daytona site acquired its reputation – a case of the landscape developing a sort of internal memory or tradition of its own due to repeated events. For all their inherent qualities, the beaches of Daytona had, in the past, proven quite moody in terms of weather and difficult to negotiate because of uneven sand surface dues to shifting tides. Several drivers had lost their lives there (Frank Lockhart in 1928, Lee Bible in 1929) – Campbell himself escaping serious injury in 1924. It was after waiting several weeks in 1935 for the weather to clear up and the beach to even out that Campbell abandoned any attempt to race there. At the urging of one of his racing colleague George Eyston, Campbell decided to go to Bonneville rather than return to England to scope out the site for himself.

Bonneville combined the length and accessibility found at Daytona (as it was mentioned earlier, a new Interstate now linked Wendover to Salt Lake City, only 120 miles away) with the almost certain promise of good weather and a hard, consistently smooth surface lacking in Florida. Given the idea of the record as a standard, it is interesting to note that Bonneville literally *outclassed* Daytona as a racing venue because of better and more stable site conditions – establishing, as it were, its renown through *difference*. Like a car entering the flying mile, racing at Bonneville – beginning with Campbell's

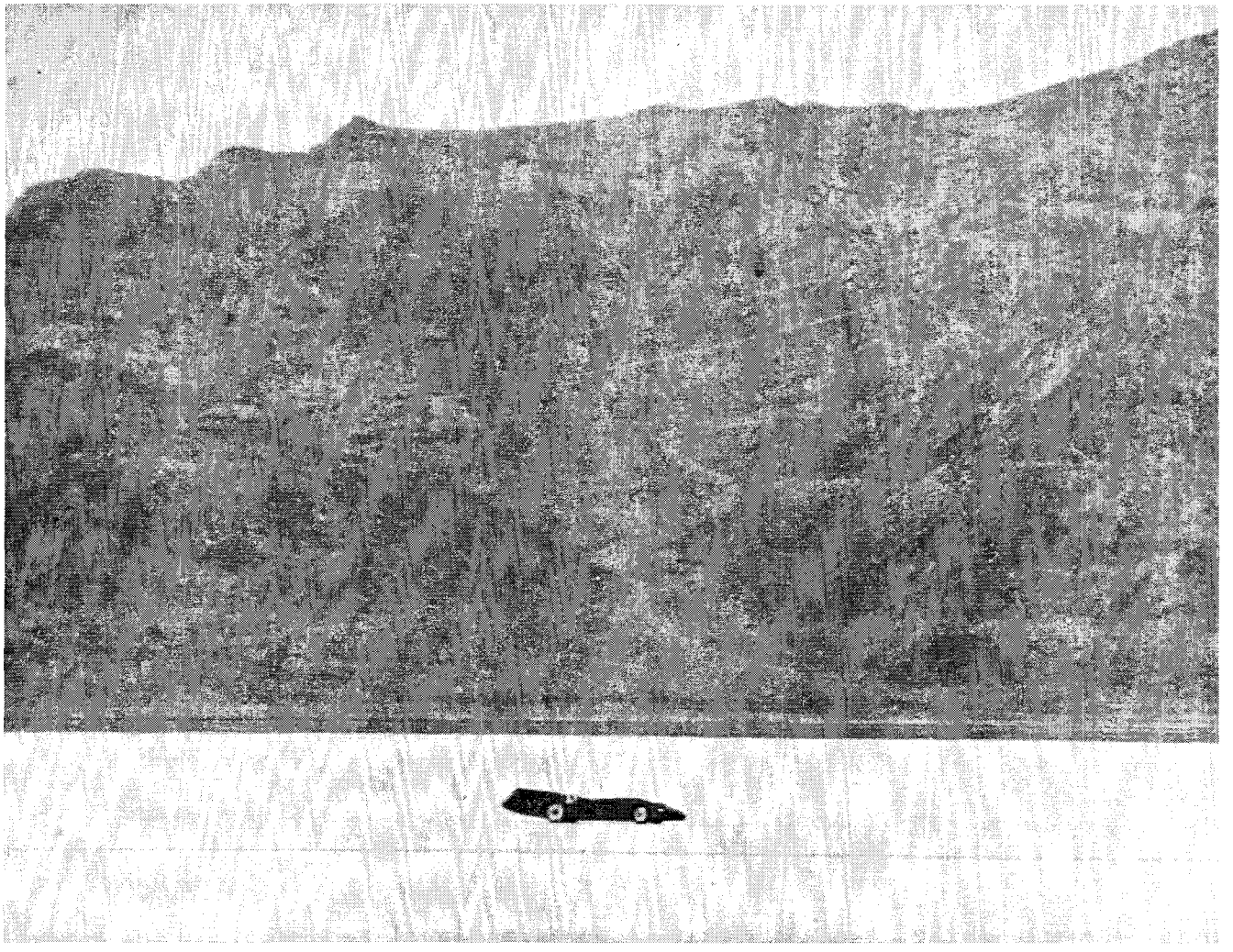

Fig. 8. Malcolm Campbell raced on the Bonneville Salt Flats only once, setting a land speed record in his Bluebird *in 1935 at over 300mph – the first official record on the site.*

new record – would mark a window of time of 35 years when the flats constituted the speed racing benchmark around the world. While we have seen that embedded in the idea of land speed record are procedures and assumptions designed not to favor singular course over another, very few attempts would ever take place outside of the salt flats during this time. Daytona had discovered its own limits in terms of speed – a point where the land played too much of a (negative) role in the record attempts –, as Bonneville would itself years later, with Gary Gabelich racing his *Blue Flame* at 630 mph.

2 LINES: THE HORIZON AND THE COURSE

Like the airport runway of the abandoned Air Force base, like the railroad tracks and the Interstate connecting Wendover to other distant cities and places, the temporary race course erected each year on the salt flats of Bonneville poetically evokes the infrastructure of transportation running through the landscape. The course on the flats is a linear stretch of salt, typically 8 to 14 miles in length, and 100 feet wide. It is traced and then scraped smooth of small salt ridges every summer, when the flats dry out from ground water. Though the landscape extends in all directions with equal fluidity, the location of the course constitutes a precise index of salt thickness on the flats: following a series of borings across the expanse of the site, a course is traced where the salt surface is at its thickest that given year, marking a continuous space where cars can run without fear of sinking into the mud flats. it begins and ends nowhere in particular, connecting 2 random points in the landscape in the shortest way possible – a straight line. Like an airplane runway linking places beyond, the course ends as abruptly as it begins – an isolated space built for length, not for the places it joins. The course is an allegory of passage, a construction that leads nowhere.

Two lines traced in oil mark the space of the contemporary course. These lines link the ground at our feet with the horizon in the distance. Unlike the horizon, which lies strictly in our eye, the oil indicates a physical ground, a near proximity, which

can be gauged with sight and validated with touch – a condition whose tangible existence we can readily verify. The lines are as black as the shadows our bodies cast onto the salt – like them, concrete realizations of gravity as the differentiated space of contact between 2 bodies. They are as real and finite as the horizon is ethereal and infinite, as wide as the other is invisible in thickness. While the horizon marks with a line the limits of our own seeing, the course constructs a set of arbitrary limits and procedures all its own: 100 feet, 10-14 miles, intermediary markers, etc . . . the course constructs a space of measurable dimensions inside an immeasurable landscape: we can verify its length, the width in between the lines, etc. . . . These dimensions, the distance between timing traps, are as absolute as is the flatness of the landscape around it. Unlike the horizon, which exists in all directions as both earth and sky, the course reminds us that the ground exists visually even in the distance, beyond our feet: a clear indication of perspective. The course is a single direction, its linearity suggesting unwavering confidence: it is a path to be traveled, towards a metaphysical destination (the sky) which can never be reached.

The oil lines are as pragmatic in their role as markers of a path as they are in their linearity. They are as straight as the perfectly constant elevation of the surface of salt beneath them – a case of man emulating nature (or nature meeting the expectations of man?). The width of the course suggests inclusion and appropriation – an interior condition. It keeps at bay those not directly involved in the mysterious operations of land speed racing and recording. Speed is not just about driving fast: underlying this abstract, man-made construction are a sophisticated set of procedures, rules and intentions surrounding the pursuit of the record. Inside the openness of the desert, the course exists as a solitary space, its protocol limiting occupation to a single car and driver: it is as thin and narrow in one direction as it is open in the other – unlimited in its possibilities and yet singular in its purpose.

Fig. 9. Mickey Thompson emerging from Challenger I *after completing a run at over 406mph in 1960 on the Bonneville track. This attempt was well within land speed record times for wheel-driven vehicles but Thompson could not complete the regulatory return run because of engine trouble.*

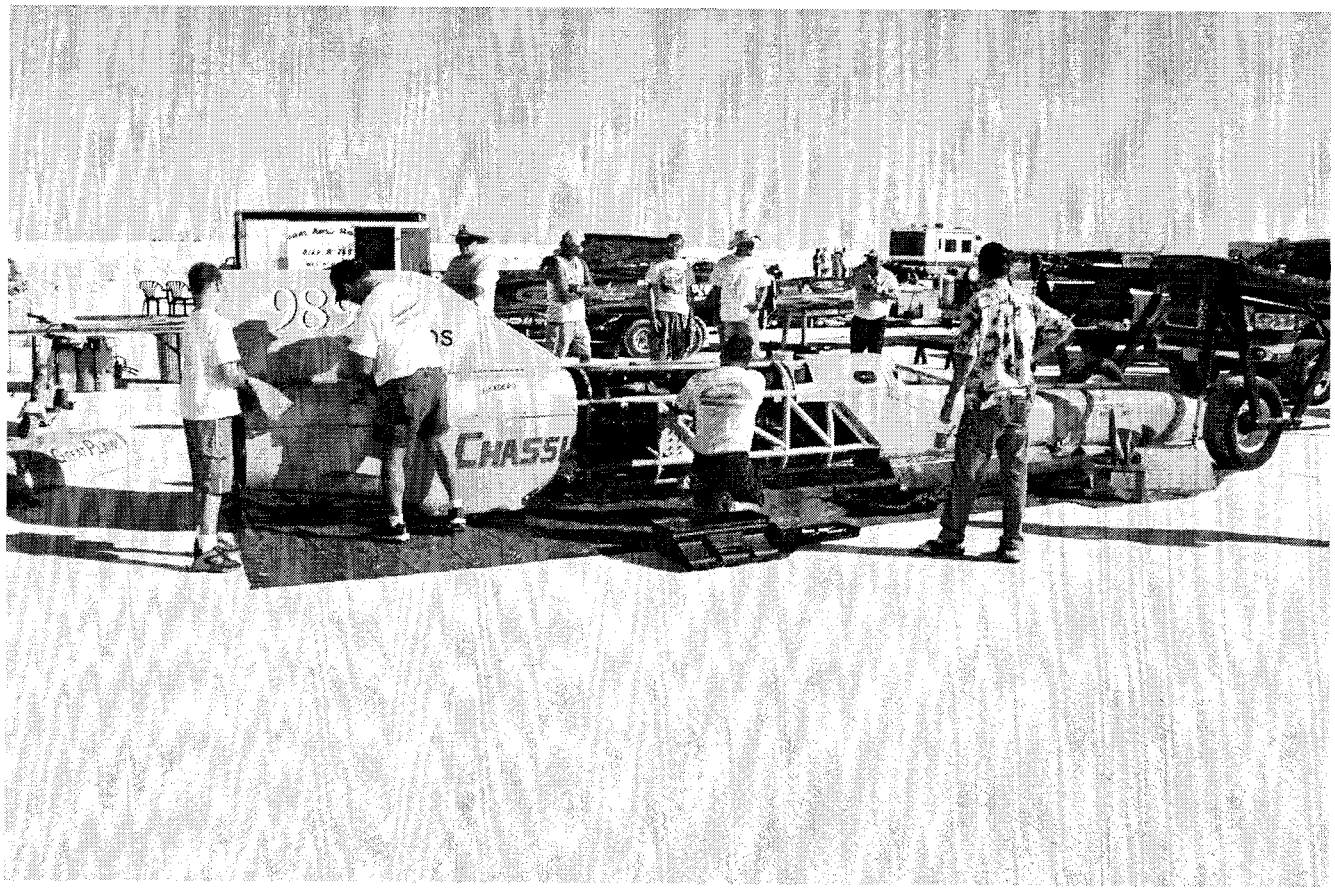

Fig. 10. Speed Week: annual racing on the flats, summer 2003. Photograph by the author.

The idea of mean speed and the window of opportunity of one hour in which the car can race in are interesting because they literally isolate specific cars and individuals from other vehicles and competitors. Consequently, no two cars can race on the same course inside the same window of time. This places each driver and car in their own *space*, so to speak, with only individual results of time as a means of comparison. One record is compared to another, with a strict set of procedures ensuring the consistency and fairness of results across different tracks, different drivers, and different times, as well as different types of cars and engines (for the purposes of this paper, the discussion of the land speed record is limited to the history of the *unlimited record*. There are several sub-categories of records based on the type of car and engine, means of propulsion, etc . . .). If cars are competing another, it is on the course of time, not on the physical space of one course or another.

RECORDING TIME: GIVING THE LANDSCAPE A MEMORY

Events on the flats over the last 75 years are a combination of singular attempts at the record as well as large scale, week-long organized racing events (typically 3 separate weeks between August and October; the first such event was staged by the Southern California Timing Association in 1949). Each year in late summer, the flats are naturally flooded with rain and melting snow water from surrounding mountains. This natural process helps rejuvenate the salt surface – cleansing it, as it were, of former occupations. While the water makes it impossible to permanently erect anything on the site, it also ensures, upon complete evaporation, the hard and smooth surface prized by racers. The period in the summer between the natural evaporation of water on the flats and its flooding later in the year marks the annual racing season. This natural cycle is as predictable (generally speaking) as the racing on the site is spontaneous: something outside of human control which was taken away reappears magically each year, setting into motion a new season of record attempts on the site, in perfect harmony with natural cycles of the landscape. It is as if the landscape had remembered to open for the races, or that in the preciousness of racing is celebrated an equally precious *natural* phenomenon – a brief window in time when occupation of the site is in fact possible.

A record is like a challenge: while it is in a sense absolute, denoting the very best of achievements, such measures can, by definition, always be improved upon: however great or small this improvement, a record denotes *absolute difference* with a previously established mark. New records displace old ones. Old standards are erased as new ones are set. Single records have stood sometimes for years (John Cobb's record stood for 16

years between 1947 and 1963), other times only for a few days (Craig Breedlove improved his own 2 day old mark in 1964). In this regard, attempts that do not set new marks matter little. Procedures, like the site of Bonneville itself, have changed little since racing began there: the linearity of the course, the flying mile, etc . . . the timing gates at both ends of the flying mile remind us that simple technologies are often the most efficient. What remains unique are the differences: a recording of the resulting measure of time between the gates, a mean speed that averages the results obtained in different directions of the course, and the fact that each attempt takes place separately from others in its own window of time.

When an old mark is broken (when a new record is set), the moment is always presented as an event: the date, driver, car, resulting mean speed, are recorded. Between Campbell in 1935 and Gabelich in 1970, we see the mark grow slowly, incrementally (smallest margin: Cobb's 4.7 mph over Eyston on August 27, 1938; largest margin: Breedlove improving his own 2 day old mark by 57.56 mph on August 15, 1964). Particular seasons have been marked with great adversarial intensity: Cobb and Eyston in 1938; Breedlove, the Afrons brothers (*each* sporting their own car), Ostich, and Green in 1964.

Behind the record is constructed a sort of institutional memory of speed. It virtually ensures that other races will take place in the future, simply because human desire for greater achievement is as strong as the natural cycles on the flats themselves. Implied in the idea of record are not only events past (including procedures) but also of human events that have yet to unfold. Bonneville exists as a racing site not simply because of the cyclical rejuvenation of the landscape, but also because of human perseverance. The tracing of a new track in a new location each year marks the first of a series of complicitous gestures which construct the site as a convergence of the natural and the man-made.

MEASURING THE LANDSCAPE: THE RACE CAR AS INDEX OF AMBITIONS

What is perhaps most interesting and contradictory about the idea of racing on the flats is that for all its minimal accommodations the site would attract such brutal wonders of technology. What comes to Bonneville fundamentally originates from someplace else, and thus must leave the site as well: this is true not only of the crews and cars, but also of the fuels and energies dispensed on the site. It is through the cars as artifacts that we discover a true index of the ambitions that populate the place. Beginning with Ab Jenkins' *Mormon Meteor* and Malcolm Campbell's *Bluebird*, these monstrous machines indicate a desire to tame the landscape, to overcome the site, to find its limits. They are the physical forms that construct in a tangible way the immeasurable dimension of the land, its lack of limits – celebrating, as the course does, an idea of passage on the site.

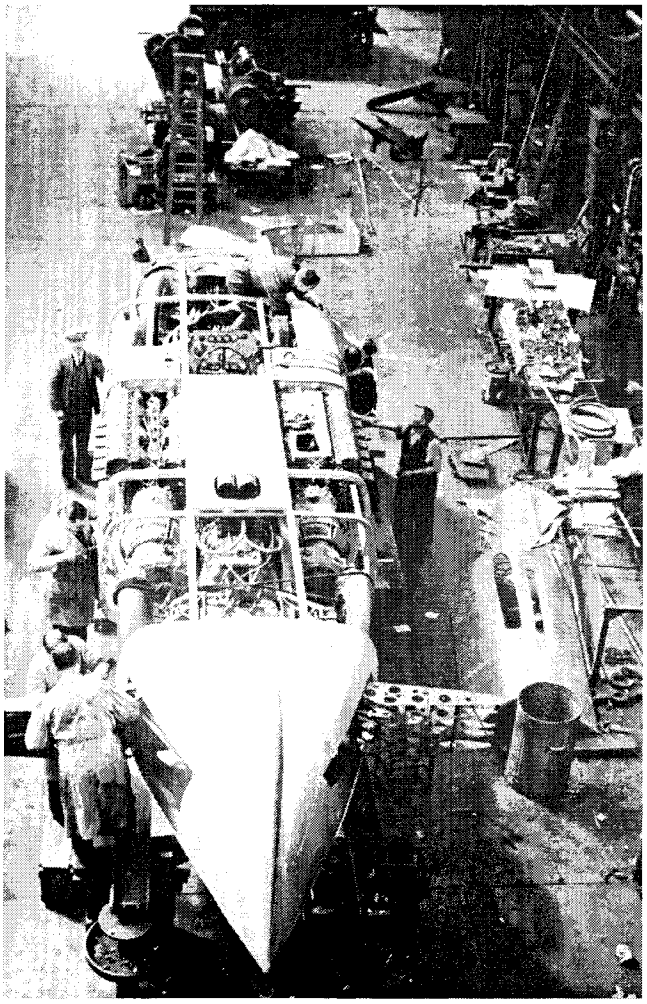

Fig. 11. Captain George Eyston's Thunderbolt *under construction, circa 1938.*

It could be argued that speed is a function not of the cars themselves but rather an idea directly embedded within the landscape, which is in turn *measured* by the car. In this regard, the cars constitute, like the ground they race on, an integral part of the site: we would not know Bonneville if it weren't for the cars that have raced there over the last 80 years. It is these wonders of engineering that enable speed to be reconceived as an human enterprise – inspired and concrete responses to the land. These vehicles, as measures of speed, have become so outrageous as to have lost any connection to our realm of driving as an experience (unlike air speed records, for example, we walk on land and therefore know it more intimately, and thus have reasonable expectations of what to find on it). Beginning around 1905, these no longer represent the very best of commercially available vehicles (albeit the most expensive, like *Benz* cars and others). Rather these are built as one-off cars – some with stock parts, but less and less so – with the sole intent of breaking speed records.

Different designs reflects changing attitudes about what is most important with regard to achieving record speeds: relationships

of power to weight, streamlining, weight ratio of particular components (fuel, engine) to the overall weight of the car, length, wheelbase, number of wheels, etc. . . . The elongated *Goldenrod* suggests a heavily distorted shape – as if the high speeds had deformed the car itself. With the advent of greater speeds, breaking tactics inspire new inventions as well: Malcolm Campbell was the first to experiment with air brakes, while Mickey Thompson's Challenger I featured a set of deploying parachutes to assist in bringing the car to a halt. Beginning in 1920 with the first of the great *Sunbeam* race cars, engineers begin to look to unconventional technologies for propulsion – airplane engines, at first, but later jet engines as well. This suggests early on an immense desire for power – the kind of velocity planes might need to acquire upon take off. Others like Mickey Thompson relied on existing technologies, instead multiplying the number of engines on their cars: 4 perfectly synchronized engines on his *Challenger I* – one powering *each wheel* of the car. With the transition from wheel-driven to jet propulsion in the early 1960s, previous records (not to mention any remaining sense of what a car should look like), are completely pulverized: Gary Gabelich's *Blue Flame* looked more like a rocket on wheels, or an airplane with their wings cropped off. The turning radius for Craig Breedlove's *Spirit of America* is 1/4 mile. Are these really still cars?

CONCLUSION: A (RE)CONCEPTUALIZION OF THE GROUND PLANE

If the notion of "record" secures the posterity of past (and future) achievements on the site, then the notion of "land" constitutes primarily an affirmation of gravity – a reminder that car and driver must first overcome the inertia of their own weight in a quest for greater "speed". Malcolm Campbell's *Bluebird* race cars in the 1930s, followed by George Eyston's *Thunderbolt* and John Cobb's *Railton Special* in the 1940s, reflected a rather bullish attitude with respect to gravity: each vehicle largely ignored weight as a design criteria (Campbell's record-setting 1935 Bluebird weighed 5 tons) in favor of monstrous engines that could produce greater sources of power. Others, like Gary Gabelich's *Blue Flame* – the fastest ever on the flats at 630.388 mph in 1970 –, instead progressively shedded most of its initial *static* weight as a result of fuel consumption during the speed run itself.

It is because we assume gravity that we can accept that cars moving across the flats describe a continuous condition of ground. One might argue that in conceptualizing this surface there is in fact no separating of car and landscape: the ground line references both the land as it does the car moving across it. Conceptually, the ground plane represents a crucial component in the differential equation of traction as well: it is the *imperfect space* in which movement occurs. Like a pencil traveling across a sheet of paper, movement induces a very physical exchange of energy in which material is spent: the transfer of graphite across the page reflects the pressure put on the pencil by the hand, as the rubber lost from the tires is an index of the resistance of the salt surface to the energy dispensed by the car (thus pushing it forward). For wheel-driven vehicles, single runs across the course often necessitated entirely new sets of tires because of excessive wear. In this landscape, traction conceptually operates in a similar way that a building would use the ground as a means to attach itself securely to the landscape – not simply relying on gravity in its effort to resist natural forces (erosion, wind, etc..) which might want to displace it.

With the arrival of jet propulsion cars in the early 1960s on the flats, we witness an important reconceptualization of the notion and role of the ground with respect to speed: propulsion is achieved in the friction with the *air* surrounding the car instead of the *ground* below the vehicle. Tires still carry the vehicle across the flats, but their role is merely to transfer the weight of the car rather than distributing energy to the ground. As was mentioned earlier, much about the land racing cars of the 1960s literally suggests airplanes with their wings cropped off: they are in every way similar, but for their need to leave the ground. Purists have stated that the land speed record should be limited to wheel-driven vehicles because they employ the ground as its means of traction (this would place Don Vesco's 2001 speed record of nearly 458 mph on the flats squarely in the lead). In this regard, perhaps these is a limit after all to this relationship of ground and speed. If the heroic attempts of Craig Breedlove, Art Afrons, Walt Afrons, and Gary Gabelich – the first to race jet propulsion vehicles across the flats – served to fuel the public imagination for pushing further the limits of speed, such attempts have since 1970 largely take place at other venues across the world. Nevertheless, the Bonneville Salt Flats remain the site where perhaps the most efficient collusion of ground and speed has to this day been achieved.

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