

Problem Positions and Nineteen Instances in the Smog Control Case Los Angeles County 1943-1976

S.F.M. van Vlijmen
bas@basvanvlijmen.com

Submitted: 26 February 2025
Revised: 15 October 2025

Abstract

This is the second of two papers which examines the aggregation dynamics in a case study of smog control in Los Angeles County in 1943-1976. First, it elaborates problem positions of some typical interested and affected parties in the case study. Second, it reworks the history of air pollution control in Los Angeles County into a foundation for further research.

1 Introduction

This article forms a diptych with another article [176]. Both articles elaborate different aspects of the same case study. A case study I used before in the introductory ‘Aggregation Dynamics: From problems and solutions to a generalised ecology’ [175]. The case study concerned the control of air pollution in Los Angeles County during the period 1943-1976. It was used as a brief illustration of the problem types discord and proliferation. The argumentation accompanying it was brief and many salient features of the case remained unmentioned. In two separate articles, I elaborate a little further on the material offered by this rich and intriguing history. In terms of style, both articles are case essays in the sense of James Krier and Edmund Ursin because of their tentative, speculative, impressionistic nature [41].

In the present article, I elaborate on different problem positions. A problem position describes what problem a party is experiencing and how it thinks about it. For example, what did the citizens of Los Angeles City think when a thick, smelly fog took away visibility and caused them painful airways and burning eyes? I want to use problem positions to figure out what kind of assertions are involved and how involved they are relative to the complexity of the context. But, that’s not for now, first I need to get acquainted with describing problem positions.

Describing problem positions requires detail, hence a relatively extended depiction of the case history. However, there is another reason to depict the history in some detail. Smog control in Los Angeles County 1943-1976 plays a visible role in several major developments that continue into the present. California led the way in developing emission standards for cars and enforcing them. It had a major impact on the automotive industry, contributing to the development of the three-way catalytic converter and unleaded gasoline. An alternative to the internal combustion engine has always been in the spotlight in California. That Tesla was founded there does not surprise. Initially, the focus was on prevention of pollution due to incompletely combusted hydrocarbons, and one did not care about other emissions, e.g. CO_2 was of no interest. That has changed quite a bit over the years, CO_2 is now also seen as a pollutant. The point here is that an institution like the Intergovernmental Panel on Climate Change (IPCC), a scientific body of the United Nations, cannot be seen in isolation from the institutions involved in the case study, such as, for example, the California Air Resources Board established in 1967. Many books have been written on the Los Angeles smog case [41, 28, 38]. So, however expansive my description may appear to the reader, it remains a very small and focused summary. It is intended as a base for supplementary aggregation dynamical case studies.

The other article in the diptych focusses on identifying problems and solution repertoire [176]. The historiography in it is limited to the minimum to understand the reasoning. The two papers are loosely connected, they can be read separately.

The articles are part of the Aggregation Dynamics project. Aggregation Dynamics studies interacting clusters of matter, or systems, in a general sense, from groups of replicating molecules to the city of New York. The theory is stated in terms of aggregations to get away from the distinction between organic, inorganic and virtual. Aggregation dynamics sees these distinctions as artificial.

Aggregation dynamics is an attempt to better understand the cumulative effect of the strong human urge to solve problems. Humans are an unstable emergent phenomenon. Hopefully, such understanding can help people to have interesting and rich lives respectful of all that lives, and help prevent people from blowing up each other and life on earth with it. Fuller introductions can be found elsewhere [175, 176].

In the human situation, problems and solutions are interesting notions to explore further. When you talk to someone about a problem, that problem and any solution to it always turns out to be part of a large context of notions, expectations, opinions, demands, norms, knowledge and so on. This context, insofar as deemed relevant by a person involved, I refer to as a problem position.

In themselves, problem positions, I believe, are a natural given; they are not a forced representation of things. But describing problem positions is not unproblematic. For example, everyone can agree from their own experience that ideas about an issue can change quickly. A problem position, on the other hand, is a snapshot in time. Does that make problem positions unusable for theorising? There are more practical questions like this. This article serves to gain experience in describing problem positions and get a picture of the pros

and cons. Ultimately, it is about whether problem positions can form a basis for quantitative reflections on the complexity of problem situations and the level of understanding of those involved.

1.1 The article in a nutshell

I begin in Section 2 *Los Angeles Smog* by presenting the history. In the sections that follow, I repeatedly work out some problem positions of individuals and organisations that figured in this history. Thus pass by: citizens in a panic (Section 3); the Los Angeles City government at the time when they did not yet know how to tackle the problem (Section 4); speakers at a public meeting in Pasadena with administrators and experts as participants (Section 5); the Los Angeles Chamber of Commerce at the stage when they were trying to evade new regulations (Section 6); *The Los Angeles Times* just before the moment it took social responsibility and position in the debate (Section 7); several cities in Los Angeles County at the stage when cooperation was becoming inevitable (Section 8). In Section 9 I reflect on the exercise, its lessons, and next steps.

2 Los Angeles Smog

The Los Angeles Times reported on 9 July 1943 that it was not a lack of sleep that made the eyes of the “Angelenos” burn. Thousands had called the police station to ask what was going on. Some feared it was a Japanese attack using chemical weapons, others asked if perhaps they were conducting smoke screen tests at the aircraft factories [109]. These two guesses the police were able to refute, but they were also in the dark about the real cause. On 27 July 1943, the newspapers wrote about the “fumes” that irritated the eyes, nose and throat and deprived vision. It was now the fourth “gas attack”, and the worst so far, they wrote. The word “smog” was available in the language at that time, but was not yet preferred in this region.

Smelly air and smoke was not a totally unknown phenomenon. Ever since the early 20th century, parts of Los Angeles County had occasionally experienced it. But it was occasional and government responses were limited to local and specific ordinances against smoke, soot and odour. And the governments were successful in doing so. In 1943, however, air pollution increased sharply in several ways: in fogginess, stench and duration, as well as in physical complaints. The police could do nothing in the all-encompassing fog; it had no clue where to start. The authorities felt compelled to take up the cause. This necessity was not only felt by the administration of the city of Los Angeles. Neighbouring municipalities as well as the encompassing county, Los Angeles County, also took action. The prevailing feeling was that one would soon be able to combat this “nuisance” effectively; America had no shortage of unity and self-confidence. Authorities pointed to a new plant, other industry, and automobile traffic. But, more research was deemed necessary before targeted measures could be taken.

Promptly, investigations were launched by experts from the City Health Department and Public Works engineers [108]. The county also established a commission of enquiry in October 1943: the Los Angeles County Smoke and Fumes Commission. Its mandate was to investigate the causes of smog and advise on a permanent solution. After some personnel skirmishes regarding candidates, a commission consisting of five members and a secretary emerged. Three of the members were or had been active in engineering science. Former Caltech professor W.H. Clapp was one of them [107].

Enforcement was stepped up by the police and judiciary. The police went out to investigate based on existing ordinances to find violations. In Los Angeles City, there was a naphtha cracker and it was causing a major odour nuisance. The plant was juridically tackled [152]. Among other things, the plant produced butadiene as a raw material for synthetic rubber. This production was part of the war economy and was under the auspices of the Federal Rubber Reserve Company. Its vice-president travelled from Washington D.C. to Pasadena to help investigate the smell nuisance and help make difficult decisions for its mitigation. It involved an investment of US\$500,000,- [111, 23]. During the smog season of 1944, the office of the district attorney set up cases against alleged offenders. For example, Standard Oil and the metal firm Morris P. Kirk & Sons Inc were taken to court. From all these efforts it became clear that litigation was not so easy due to fragmented authority and lack of experience with the diversity and scale of the air pollution issues. Health director Dr. H.O. Swartout indicated that county health legislation was unsuitable for speedy action because it required incontrovertible proof of health damage, too time-consuming a process given the urgency [122].

To work more effectively, the county board and the attorney looked for ways to increase judicial discretion through state and marginal law amendments [90, 106]. To facilitate intervention, the committee suggested introducing a tentative remedial law. To this, the Los Angeles Chamber of Commerce had responded by saying that hasty intervention would jeopardise the war effort, at the same time the chamber stressed the importance of investigation and seeking a broad and long-term approach [114].

Meetings were convened with Caltech and various engineering firms to establish qualifications for “fumes engineers”. New processes and plants that would be installed at major factories in the short term gave hope, Swartout said, that much of the fumes nuisance would be overcome in 60 days.

The control efforts had no effect. In the summers of 1944 and 1945, smog reared its head again. Discussion about it did not subside, nor did citizens’ protests, although outside the smog season, interest and excitement subsided again. On the seriousness, who was responsible, and the course of action to be followed in combating it, all concerned, from citizens to politicians to industry, disagreed.

In mid-September 1944, The Los Angeles City counsel met on whether to seek advice from other cities with a smog history as Pittsburgh or St. Louis. A key discussion point was whether enlisting help did not display one’s own helplessness on smog. Los Angeles was a strong industrial city. One question

raised was whether identifying Los Angeles with industry was still tenable. The proposal to seek advice made it through. However, Councilman Rasmussen who was to implement the decision was strongly against the proposal. The newspaper feared that the proposal would thus be stifled in implementation [105].

A month later, Los Angeles City counsel's Health Committee called for its own department whose director was to come up with a report within 90 days [112]. That department was created and Major Harry E. Kunkel was to lead it [26]. In the Los Angeles County Smoke and Fumes Commission, things were rumbling. The chairman of the county board, Roger W. Jessup, wanted to get rid of the commission's chairman, Al Waxman [59]. The county commission as a whole was disposed of in early 1945 under words of praise [156]. The county gave the lead in the smog battle to a new division of Swartout's health department. Isador A. Deutch went on to head the new department. The city had thus preceded the county with such a department [25].

At an inter-city conference on smog, September 1945, Clapp had complained because he felt that nothing had been done with the recommendations in the Los Angeles County Smoke and Fumes Commission report. There were voices at the conference calling for state help through the legislature [116, 50]. In April 1946, more than a year after the commission was dissolved, Swartout, in the role of County Air Pollution Control Officer, lashed out at Caltech, Pasadena's highly regarded Technical University. He blamed her for the lack of progress in smog control; she had not wanted to contribute, even after long negotiations. Among other things, Clapp had represented Pasadena on the committee and had mediated talks with Caltech. He countered that Caltech had struggled with the role assigned to it because, in its view, the problem was primarily a political one [53]. The political will to tackle the problem was lacking, he argued.

The political side of the issue was reflected, among other things, in the unwillingness to tackle the industry. Another problem was the fragmented authority of the various police departments and other controlling and implementing agencies in dealing with a problem that did not care about boundaries. The county had, and still has, incorporated and unincorporated areas. The former are communities that self-manage key social facilities. Examples include Los Angeles, Pasadena, and Torrance. Unincorporated are communities and rural areas that only partially have their own facilities, the county takes care of the rest. On air pollution, there were sometimes separate agreements between county and incorporated areas. Local ordinances were not uniform [128, 90]. The county attempted to line this up with a voluntary and makeshift model ordinance [114].

This ordinance was circulated for comment. In January 1945 Long Beach attorney Irving M. Smith and city manager Samuel E. Vickers considered a "smoke and fume abatement ordinance" [43], which provided "US\$50,000, - to initiate investigative work across the county as soon as possible." In May 1945, it was announced this ordinance would take effect the following month. Swartout and his new "air pollution control engineer," Deutch, were involved in drafting it. At that time, they were finalising the rationale for the county council on measures to be taken. One measure concerned "high efficiency incinerators" for privately disposing of combustible waste [48].

But those ordinances did not move that fast; it was not until September that year that county supervisors enacted two ordinances. But, those ordinances applied to the unincorporated areas while the polluting sources were actually thought to lie in the cities, the incorporated areas, especially the huge industrial belt around the city of Los Angeles formed by Vernon, South Gate, El Segundo, and Torrence. In November 1945, “16 foothill cities” led by Pasadena pondered the model ordinance [47]. Barely a year later, *The Times* reviewed the state of affairs in an acidic editorial commentary. The model ordinances had been sent to 44 incorporated areas asking if they would adopt them, or a modified version of them, locally [122]. Eight of them had adopted the model ordinance; others had responded to consider the proposal favourably without taking action. Even Pasadena had not endorsed the ordinance. Torrence had only acknowledged receipt while Vernon and South Gate had ignored the documents. The attempt at voluntary unity had failed.

2.1 *The Los Angeles Times* takes action

Caltech was not alone in observing an administrative procrastination. At a public meeting of the board of the city directors, 2 October 1946, 300 Pasadena residents expressed anger. One complained that the problem had been serious for five years by then and that it was not even clear what substances were causing the sore eyes. And also, that many factories were known to be the source, but the government just did not dare to intervene. A speaker at the meeting referred to the upcoming elections and urged those present not to let their power go unused then. Albert I. Stewart, lower house member for Pasadena, said that if he were re-elected he would try to push through legislation at the county level because that was where he saw the solution to tackling the smog problem. This was an idea others at the meeting had suggested earlier. One lady announced that she had put her house up for sale; she was planning to leave the polluted area.

The Los Angeles Times was a conservative newspaper that was well aware that business profit came from the growth and prosperity of the community it served. Promoting this growth and flourishing by advertising the city, taking a position in political debate and supporting well-chosen developments with journalistic vigour was no stranger to the newspaper. The paper’s management belonged to the establishment. With the smog issue, the management did not know what to do in the first few years. According to Chip Jacobs, the co-author of *Smogtown: The Lung-Burning History of Pollution in Los Angeles*, the gravity of the situation dawned on them when they realised that this growth and prosperity was threatened by smog: “They were, in a way, sort of the greatest champion of Los Angeles and they had a lot to lose. If people started leaving LA by the tens of thousands, who were gonna read their paper, right?” [69]. The management took a leap of faith. The newspaper elevated smog to a regular theme of its editorial board and started campaigning. The leadership of the anti-smog campaign was put in the hands of Ed Ainsworth, a versatile and well-known editor, speaker and writer [115, 118, 119, 125].

Ainsworth’s campaign kicked off with a series of large articles on consecutive days. The first came out on 13 October 1946 and he wrote [2]: “The Times hopes, by presenting the facts and pointing to certain possible remedies, to lead the way towards a permanent solution of this blight which threatens the health and future of the metropolitan region.” The second article gave a page full of pictures of smoking chimneys. Figure 1 gives an impression of the type of photos used. The third reported on thirteen lawsuits filed against businesses and individuals suspected of causing serious air pollution [4]. Downright activism in this was the bold call for readers to report in writing to the “smog editor” on any source of smoke or vapour one observed. That information would be forwarded to the appropriate authorities.

On 1 December 1946, it was announced that professor R.R. Tucker of Washington University had been asked, at the newspaper’s expense, to investigate the situation in Los Angeles and formulate an advice. Tucker had been instrumental in curbing smog problems in St. Louis; he was regarded as a national expert [5]. Tucker arrived a week later and spent about two weeks in Los Angeles [117]. He completed the report in January 1947. On the radio, there was a panel discussion with Tucker, Ainsworth, and senior officials and lawyers from the city and county of Los Angeles [121].

Even before Tucker’s departure, the newspaper set up an action committee, the Times Smog Advisory Committee, which soon after became known as the Los Angeles Citizens’ Smog Committee [120, 132]. Members of the committee belonged to the establishment. The seen William M. Jeffers, former president of the Union Pacific Railroad and wartime rubber administrator, accepted the role of chairman. The committee was in direct contact with the business community, newspapers, the chamber of commerce and dozens of Los Angeles County city councils. Of the latter, Los Angeles City was by far the most important. The committee also had a short line of communication with the county board and the lower house of the State of California. The county supervisors supported it with a secretary, former general Amos Thomas [7, 136].

2.2 Assembly Bill No. 1

The failure of the model ordinance led to sharp reproaches and threats back and forth in late 1946: “industrial communities of Torrence, Vernon, El Segundo, Long Beach and Los Angeles flush their aerial sewage down Pasadena’s cultured neck”; “If the culprits won’t recognise their responsibility to their neighbours immediately, the neighbours should waste no time in turning the weight of their majority on the Legislature” [123]. The fragmentation of authority got in the way of addressing parties who caused smog, and made it easy for unaffected parties to look away. For, the smog was not equally bad everywhere and that was exploited politically. Regions that were little affected were apathetic or they deliberately refused giving up a chunk of their autonomy for a problem they did not experience, let alone that they wanted to contribute to the solution. However, the people kept up the pressure.



Figure 1: On 14 October a page full of photo's of smoke plumes appeared. This one of these. Source: *The Los Angeles Times*, 14 October 1946.

Albert Stewart called for “unified action” and worked with others on a model anti-smog law [52, 129, 51]. He had been lobbying for this for some time [49]. To stand stronger, like-minded parties sought bilateral cooperation. Pasadena signed a contract for cooperation with the county on 30 October 1946, also conforming to county ordinances [54, 55]. County counsel Harold W. Kennedy, one of the people in the lobbying group around Albert Stewart, involved Tucker in ideation about the new “unified anti-smog district” on 21 December 1946 [3]. Albert Stewart made good on his public promise; on 9 January 1947, a bill, Assembly Bill No. 1, was tabled by the state legislature supported by the signatures of 34 assemblymen [56]. Lobbying continued to overcome local and inter-regional divisions and opposition, for example within the local Chambers of Commerce [1].

Well into 1947, the Los Angeles Chamber of Commerce was still advocating a voluntary programme to support the city and county’s efforts [126]. The idea was that a group of scientists and experts working under the Chamber’s leadership would help industry take action and share knowledge. The promise was that by doing so, so much improvement could be achieved and the air would become so much cleaner that there would be no need for government action. *The Times* reported on this voluntary programme on 20 March 1947. Assembly Bill No. 1 had been tabled by then. That sounds post hoc. But the bill had not been ratified by the Governor yet. According to Dewey, the intention was to forestall the new law [28, p. 86]. By contrast, the State Chamber of Commerce, of California that is, favoured county-level legislation [101]. The director of the State Chamber of Commerce warned that apathy among representatives of counties that were not affected by smog could kill a legislative amendment. The State Chamber had given a unanimous positive opinion on the proposed Assembly Bill No. 1 in order to give weight to it [57].

State cooperation was needed for legal technical reasons. Only the state could lift local legislations on discharges to county level. The bill was passed modulo amendments by the California Senate. On 10 June 1947, Governor Warren ratified the law [127]. A county could introduce the law after its administrators convinced those present at a public hearing that it was necessary. Los Angeles County went straight to public consultation. The public agreed, and thus the first air pollution control district became a reality. Los Angeles County’s first action was to set up a department that would implement the new law. It was called the Air Pollution Control District (APCD). The law prescribed such an administration [134].

The new legislation was more specific and stringent than previous local laws. “Under the present system, the county and city of Los Angeles and all the 45 incorporated areas in the county have had a divided authority. Assembly Bill No. 1 will channel State power down into Los Angeles County so the administrator may go within incorporated as well as unincorporated areas to enforce the law” [130]. Chairman Jeffers articulated and put the change in perspective as follows: “we simply lift provisions of present acts to a higher unified level” [131].

2.3 McCabe and the Air Pollution Control District

Louis C. McCabe would first assume the role of director of the Air Pollution Control District of Los Angeles County [6, 7]. He formally arrived in Los Angeles on 1 October 1947.

McCabe was an Arkansas geologist with a background in coal mining, analysis and combustion. He was involved in research on reducing smoke production in coal combustion. During the war, he secured coal supplies for the war effort and later directed coal mining and distribution in newly liberated Belgium and the Ruhr and Saar regions. After the war and before moving to Los Angeles, he was head of the coal division of the U.S. Bureau of Mines.

McCabe's first activities involved establishing contacts with industry and influential bodies, hearing from stakeholders and violators of regulations, setting up investigations and systematically informing administrators and the public. He had laid down plans for a budget, a staff, official cars, an office and a laboratory. The first staffing came from Los Angeles County's Air Pollution Control Department, which merged into the new APCD. In early February 1948, the City's eponymous department also merged with the APCD [6, 45]. By then there was also a budget. He worked on many fronts at once.

McCabe regulated waste incineration at public landfills. In the Whittier community, people wondered what to do with the rubbish then. The fire chief feared fire danger if people then started burning rubbish in backyards. Whittier threatened to leave Los Angeles County and join neighbouring Orange County [157, 38, 165, 167, 138]. With financial help for the construction of an incinerator, Whittier eventually complied and adapted the local "city ordinance for controlling the burning of rubbish" [166]. Residents were allowed to use certified "home incinerators" themselves. [168].

Under McCabe's leadership, research into the causes of smog gained momentum and a firmer institutional base. McCabe had recruited a new team of prominent scientific advisers from three universities. Among them UCLA meteorologist Morris Neiburger and former Caltech professor Arnold Beckman. The latter was at the time a leading manufacturer of measurement equipment, among other things. Beckman participated as a dollar-a-year man.

McCabe first bet on lines of research familiar to him with sulphur dioxide as the main pollutant. That course pointed in the direction of oil refineries and chemical plants [135]. Discussion ensued with industry contesting this claim based on its own research, pointing to improvements already applied [137]. Older and ongoing research on other causes temporarily came under pressure or was stopped, for example that on car traffic.

The possible role of automobile traffic had not gone unnoticed. Prominent US chemist Dr. Gustav Eggloff of Chicago had pointed to emissions of unburned hydrocarbons as a possible cause as early as 1944 [113]. Deutch and Kunkel of the county and city Air Pollution Control Departments, respectively, had pointed out that in areas with heavy vehicular traffic, eye irritant fumes were most evident [28, p. 46-47]. Even Tucker had pointed out the role of car traffic, albeit assigning it a modest role. Many were eager to believe the latter [127].

On the day *The Times* announced that Governor Warren had signed the new law, Dr. Robert A. Millikan, Caltech professor, Nobel laureate and member of the Los Angeles Citizens' Smog Committee that had so ardently and successfully advocated the legislation, claimed that in his opinion "automobiles have been eliminated as major offenders in the creation of smog." This attitude is nicely illustrated by the page from the 17 December 1950 issue of the *The San Francisco Examiner*, see Figure 2.

The California legislature was curious to see how the APCD and the legislation functioned, started hearings and unpleasantly questioned McCabe [85, 27, 139]. In the end, the verdict was positive.

2.4 Arie Haagen-Smit

Beckman had advised McCabe to involve his friend Arie Haagen-Smit in smog research [38, p. 71]. The Dutch chemist Haagen-Smit was not working in atmospheric air pollution but in another field, namely the organic chemistry of plant hormones. These substances, among others, are excreted through the air, often in extremely minute quantities. Within Haagen-Smit's field of research, techniques had been developed to condense and concentrate very small amounts of volatile organic compounds from air fractions. It worked by stepwise extreme cooling. That technique had now been applied to air containing smog, and successfully.

On that basis, five months later after the sulphur dioxide controversy, McCabe came up with an entirely different theory. His organisation and Haagen-Smit had found organic peroxides in air samples, substances they claimed were extremely irritating to the eyes [8]. Incomplete combustion of fuel was now identified by McCabe as a major cause of smog. Although it was not yet said out loud, it was clear to the good listener what combustion, among other things, was meant by this.

The auto industry kept quiet. The oil industry, however, did not accept the new insights. Whereas earlier their production process had been taken to task, now the products themselves were made suspect, an even more serious danger. On 27 September 1948, in a letter to McCabe, Western Oil and Gas Association president W.L. Stewart Jr. disputed the conclusions of the APCD report [137]. He did so based on research by the Stanford Research Institute. Moreover, he reported that the oil industry had already taken many measures, with the result that, among other things, sulphur emissions had meanwhile become lower than in the pre-World War II period. In short, the oil industry threw off the accusation, and since "it is obvious to every citizen that we still have smog", the cause had to be sought elsewhere. The oil industry continued to frustrate research [10, 140, 141].

They even went so far as to discredit Haagen-Smit's research. When Haagen-Smit's initial results became public, the oil industry, as mentioned, asked Stanford for counter-expertise. The anecdote here is that Beckman arranged for one of the researchers involved to come and present the latest Stanford results at Caltech. He made sure that both he and Haagen-Smit were in the audience. In

the presentation, Haagen-Smit received a sneer: how could such a prominent chemist like Haagen-Smit be so wrong? Haagen-Smit felt deeply aggrieved. The effect Beckman intended was that he was now going to really get stuck in, to prove definitively that he was right [69]. Haagen-Smit took the bait.

Together with others, he did a thorough review of the earlier research and also showed why Stanford had failed to reproduce its results. After several reports and publications, a paper explaining the chemistry of smog and a paper unravelling smog damage to crops appeared in June 1952 [34, 35]. It was like this. At the root of smog formation was a simple reaction. Under the influence of bright sunlight, nitrogen dioxide breaks down into nitrogen monoxide and a free oxygen atom. In the presence of a range of hydrocarbons from more or less incinerated oil products, a cyclic chain reaction developed from this, producing peroxides, again ozone, aldehydes and acids. Polymerisation and interactions with sulphur compounds gave rise to the aerosols. Others had already explained how geography and meteorology prevented refreshment of the county's lower air layers at certain times of the year. Los Angeles County lies by the sea and inland is largely enclosed between geological formations. This promoted a meteorological condition during the smog season: temperature inversion. In this, a blanket of warm air lies over a layer of relatively cool air and holds it in place. A few years earlier, in 1946, meteorologists James G. Edinger and Morris Neiburger, had investigated and named the phenomenon [44, 133, 124]. The sun had free rein to keep the reactions in the trapped lower layer of air going. The riddle had been solved.

Haagen-Smit was to become the national expert on air pollution in the years that followed [18]. At the end of his career, he became the first chairman of the California Air Resources Board (CARB), founded in 1967. He had co-lobbied for its creation [19].

2.5 Anti-smog action committee

That progress was being made on the scientific, legal and organisational front had not impressed the public as the smog situation did not lessen noticeably for outsiders. Housewives took to the streets and homeowners protested that their property was devaluing [58, 147, 150]. The local Highland Park Optimist Club had a luncheon meeting on 14 October 1954 where the dress code prescribed a gas mask, see Figure 3. This international service club aims to create an optimistic and bright future by encouraging young people to be the best they can be [60]. The lunch meeting was obviously meant to attract attention and an expression of protest against the ongoing smog.

A number of citizens mockingly set up the Anti-Smog Action Committee. The committee organised a public hearing and in a newspaper announcement they wrote: "This is a citizens' meeting, not a political rally or fundraising campaign. The politicians haven't been invited. Neither have the glib talkers from the Air Pollution Control District who insist everything is being done that can be." Those politicians were there, though they didn't do the talking. The call for the meeting went under the headline "Let's Go, Little Guys" [63]. One



Figure 3: Local Highland Park Optimist Club held a lunch meeting with gas mask as dress code [147].

clearly hinted at the sentiment that the civilians, the “little shots”, were being sacrificed and the big shots spared. At the public hearing, which took place on 20 October 1954, the Anti-Smog Action Committee showed that it was not alone: 3,000 people filled the Auditorium and another 1,500 listened to the progress of the meeting in another room [143]. The finger was pointed at the industry, but also at the government for allegedly doing too little to protect the public. Air Pollution Control District officials were blamed for not doing their job properly [95].

One of the committee’s founders was Francis H. Packard, an auto insurance agent. He and his co-founders attacked senior officials harshly, accusing them of colluding with industry and hiding behind meaningless scientific research. They employed a populist style of campaigning. Packard developed political ambitions and used his fame as an anti-smog activist to try to get elected to the sub-district council, which, incidentally, he did not succeed in doing [32, 172].

The county felt they needed to take visible action with the aim of engaging the public and taking the wind out of the protestors’ sails. McCabe’s successor, Gordon Larson, was sacked [17][28, p. 50]. Samuel Smith Griswold would succeed him.

2.6 Automobility

Although the protests seemed to indicate otherwise, the authorities had actually not been idle. A team of inspectors had emerged and was also growing steadily and doing serious work. Access to industrial complexes by inspectors had been arranged and use was being made of it. Rubbish incineration, something many private individuals did in their backyards, had been curbed. Evaporation from fuel storage and transfer was curbed [142, 144]. Public transport looked at alternative fuel [171]. Train traffic was electrified. Many factories had improved their production processes. It was not enough, however, because against all these efforts, the growth of the automobile society had continued. Orange plantations were rapidly giving way to highways.

“Smog chief” Samuel Smith Griswold repeatedly stated that the “car exhaust” was the largest and also uncontrollable source of air pollution in the county. Smith Griswold vigorously continued the proactive line of control and research of his predecessors, while also giving much more attention than his predecessors to public education.

One newspaper reader suggested setting up “car pools” [39]. The reasoning was simple: fewer cars on the road means less smog, and also less traffic jams. Smith Griswold himself also proposed a large voluntary programme of carpools. Those pools would then have to become active when smog started to exceed a threshold. That moment would have to be determined by a scientific committee. Should problems persist, factory plants, such as refineries, would also be shut down. Civic groups, clubs, and societies as well as employees of companies and industries were urged to take the initiative in forming pools [65]. The plans got stuck. However, that it was not impossible to organise carpools had been shown earlier when a bus strike had loomed [37, 24].

Under the heading ‘AS WE SEE IT ...By One of Us’ a weekly editorial commentary appeared in the *The Pomona Progress Bulletin* on various issues. On 20 July 1954, it was about the great sales figures of Ford, GM’s Oldsmobile and Cadillac. A paragraph below that mentioned increasing smog “more and more of the eye-smarting stuff has been blown into this area.” As if it was all blowing in from elsewhere. “And, although nobody has the answer yet”, hopes were pinned on the Air Pollution Control District allegedly working to reduce emissions “of things that make smog” and on the progress expected from research work by the Southern California Air Pollution Foundation [158]. The Anti-Smog Action Committee was more radical. According to it the government was not doing its job and the real polluter, industry, was not being tackled. People were still blind to their own role by car use [65, 68].

The number of cars per family was on the rise observed Smit Griswold, an average family had more than 1.5 cars at its disposal and 2 had been the fashion for years he saw [174]. Apart from trying to find short-term solutions, such as with carpools, Smith Griswold and others also translated the smog problem time and again as a problem of the auto industry [66, 146, 149]. He saw that the auto would not disappear and was not opposed to a society whose design was based on automobility. The solution had to come from a different quarter, from the automobile industry. Smith Griswold repeatedly put pressure on the auto industry and also threatened stricter legislation to force adjustments. But such regulation again met with principled political objections in free enterprise-oriented and liberal America.

With the increasing focus on the automobile industry, the situation changed for the oil industry. Initially, the public and the government had pointed to oil industry installations as a direct source of smog. Through the work of Haagen-Smit and others, that perspective shifted for and on them. The use of the products, that was where the bottleneck was, they felt. Incomplete combustion in engines, mainly car engines, released the reactants for smog into the air. In the summer of 1954, Stanford presented a major report stating unequivocally that car exhaust was the only major source of pollution, now as if they had thought it up themselves [145]. The threat now stemmed from the possible government regulation of the car market, such as through carpools, or other interventions that would potentially mean loss of revenue or require large investments. So the threat to the oil industry’s livelihood remained, but in a more indirect way.

The oil industries could start to shift course, but they did not immediately abandon their previous defensive position and tactics. In response to the Stanford report, oil industry spokesman C.A. Dayer added that waste incineration was another uncontrollable source [67]. Some months later, Dr. A.M. Zarem, a research leader at Stanford, claimed that so much was still unclear [148]. The oil industry presumably knew that the car industry was working on techniques to reduce emissions of substances that contributed to smog formation and waited [146].

In the mid-1950s, the discussion shifted slowly. The theory about auto emissions, sunlight and the meteorological and geographical situation of Los Angeles had been sufficiently clarified and had also become accepted in scientific circles.

Administrators now also understood the issues, but reluctantly. The political battle with the public and industry over how to proceed had only just begun [173, 174]. In the years that followed, the Anti Smog Action Committee lost momentum. However, other groups, such as Stamp Out Smog, with acronym SOS for good reason, picked up the thread with equal fervour [38]. This was necessary because the APCD was also beginning to show signs of wear and tear that would eventually lead to its fall and integration into a new multi-county organisation. More on that at the end of the next section.

2.7 Regional clusters

In San Francisco in 1950, smog problems were not immediately serious. But, alerted by reports of Los Angeles, people saw the storm coming. The city council initiated investigations and looked for ways to get ahead of problems.

Mayor Robinson was quoted on 17 December 1950 in the *The San Francisco Examiner* saying, “What good would it do for San Francisco to watch over its own industry while winds blow pollution over the city from the East Bay” [21]. He, along with smog experts, felt that regional control was needed and that to that end, the 1947 legislation needed to be drastically revised. He even characterised the law as “worthless” because it did not provide for regional control bodies and because it did not mandate such bodies. Robinson tried to make minds ripe for a regional approach, which did not come naturally as the Bay area administrators he had approached a year earlier had responded faintly to his proposals. His initiatives were also opposed by other parties. The Bay Area Council and a Chamber of Commerce repeatedly beat the drum of voluntary smog prevention by industry.

Discussion on regional approaches continued. County San Mateo did not want to wait for a regional arrangement and became an air pollution control district in accordance with Assembly Bill No. 1 [84]. Santa Clara had preceded San Mateo in 1948 by becoming such a district. The pros and cons of a regional district caused debate. By becoming part of a regional district under a new law in 1955, the local Santa Clara district lapsed. One advantage was being directly at the table with counties north of Santa Clara, which caused smog. A disadvantage was that enforcement would require a longer legal process [36].

A California state commission had recommended the formation of a bay area pollution district in early 1955. In it, the nine counties that comprised San Francisco bay should take their places [99]. On 8 July, Governor Knight signed the law creating the Bay Area Air Pollution Control District with immediate members San Francisco, Marin, San Mateo, Santa Clara, Alameda, Contra Costa. This established the first inter-county body in the country. The counties of Napa, Solano and Sonoma also officially joined sometime later after their boards decided to do so [70, 14].

Regional aggregation around Los Angeles County had a longer run-up. In 1950, Orange became an APCD after consent was sought from residents and others at a public hearing [160]. Riverside and San Bernardino attended a private meeting with the governor of California in 1953. The state offered assistance.

Ventura, Riverside and San Bernardino were urged to become an APCD. In Riverside, a civic committee was studying the APCD concept, San Bernardino was in the process of setting up one. It was decided that the problem was local and that legislation and enforcement should be regulated on a county-by-county basis [13]. San Bernardino and Riverside became APCDs in 1956 and 1959 respectively [100, 102].

The road to a regional arrangement was complicated by several factors, I will discuss three of them. In 1957, a bill was before the state seeking a district for Los Angeles, Orange, Riverside and San Bernardino. Los Angeles would have 7 of 13 votes in the bill tabled. But the others did not like that at all because they feared the control that, euphemistically put, “any highly populated county might have in air pollution control matters.” San Bernardino preferred to seek affiliation in a larger region, with counties Kern and Ventura joining it [162, 82]. In 1959, opponents argued that a county levies taxes for its functioning, but that a county should not give away that right. Proponents argued that state power was needed to break the inhibiting influence of local industry on county governments [103]. Ten years later, a different type of argument played out. The California Air Resources Board (see the next Section) divided California into basins based on geographic and meteorological similarities [20]. In 1970, the discussion was about forming them, and also about forming “coordinating councils” for a South Coast Basin. Those basins did not respect county boundaries, but followed a geographical and meteorological logic. And that was at odds with regional districts [46, 83].

In the late 1960s, the Los Angeles APCD came under increasing fire from the public, the press and protest groups. The service had achieved much but urbanisation, automobility and industrialisation had also continued and the battle with ‘Detroit’ was not yet won. In June 1969, the conflict reached a climax. The department was accused of focusing blindly on cars while neglecting other emissions. Stamp Out Smog asked why a new regulation to control nitrogen oxide emissions and to stop future construction of large power plants, that had been prepared 14 months earlier, was still not in force. The APCD moved quickly and piloted the regulation, Rule 67, through the debate. It was ratified by the county six months later. However, it was clear that the APCD was beginning to lose momentum. In the early 1970s, neighbouring counties interfered in the smog debate.

Summer 1972, the mayor of the City of Riverside filed a formal complaint with the state about air pollution from Los Angeles County. A grand jury investigation and hearings before the California Air Resources Board followed. The APCD was taken to task for laxity. Summer 1976, as a result of a state law, the APCD was abolished and replaced by a new organisation: the South Coast Air Quality Management District. This district included the counties of Los Angeles, Orange, Riverside and San Bernardino [28, p.106-110].

2.8 The California Air Resources Board

California established the Bureau of Air Sanitation within the Department of Public Health in 1955. This bureau served to support local governments with technical assistance, medical research data and air monitoring data [96, 161].

Summer 1960, California passed the California Motor Vehicle Pollution Control Act, which, among other things, adopted federal automobile emission standards. It created a new agency, the Motor Vehicle Pollution Control Board as a division within the Motor Vehicles Department [98][28, p. 63]. The new administration needed to work on standards and a “smog control device” for cars [159]. The quest for that had been going on for several years, but was now lifted to the state level [64, 93]. The director of the Department of Motor Vehicles was also on the new board and started a discussion on what an “automobile exhaust control device” should cost. He felt \$35 was an upper limit, considering that car owners already paid \$62.50 a year in fuel tax and \$22.50 for their registration [164, 9]. Six months later, a prototype was shown to the board. The presenter opined that the cost would be at least twice as high, not to mention maintenance costs [104].

Both departments were merged into a new agency, the California Air Resources Board (CARB), in 1967. This agency was part of the Mulford-Carrell Air Resources Act that Governor Ronald Reagan signed on 30 August. Arie Haagen-Smit became its director. CARB was of a different order from its predecessors; it was not a subsumed subdivision. It was tasked with formulating air quality standards and setting restrictions on motor vehicle emissions and other air pollution [19]. Such standards were already well under development but CARD stepped up the reach and rigour.

On 2 November that year, the federal Air Quality Act also took effect. In it, California was given the option to deviate from the national standards – the waiver – provided the local standards were more stringent. CARB repeatedly used that leeway [177]. California made catalytic converters mandatory and introduced tests to measure vehicle emissions, not only at the factory but also on the road [38]. In 1972, Volkswagen and Chrysler ran into trouble, failing to meet the standards [30]. It was news in every newspaper in America. In the decades that followed, the service grew into a nationally and internationally leading institution in the field of air pollution control. A role it still has today, even as the discussion has broadened to include CO₂ and climate change.

2.9 Federal laws and international developments

In the late 1940s and early 1950s, air pollution problems made their way into Washington DC through various avenues. The problems in Los Angeles repeatedly made the national news, and there were more hideous incidents. In Donora, a town close to Pittsburgh but with its own heavy industry, at least 19 people died from smog around the weekend of 30 and 31 October 1948 [12]. An event that was surpassed by large numbers of deaths in London in 1952. But it was also Californian congressmen who tried to raise the issue with the federal gov-

ernment, particularly because Californians felt that the research burden for a national problem was borne somewhat unilaterally by them.

The first bills for a federal role fell through, including the bill by Senators Thomas H. Kuchel and Homer E. Capehart, who therefore suggested to President Eisenhower that an intergovernmental committee be convened to discuss the federal government's role on air pollution. The committee came about. McCabe, back in a senior post at the Bureau of Mines, was one of its members [89]. In his State of the Union address on 6 January 1955, Eisenhower asked Congress to pay attention to the nation's air pollution problems. Kuchel and Capehart again came up with a proposal, The Air Pollution Control Act. This act was passed after amendments. On 14 July 1955, Eisenhower signed the act. It provided for a modest federal role. This consisted mainly of help with research, training and technical assistance. The state did not interfere with local legislation and enforcement.

The law had an impact as local governments took advantage of the facilities provided by the federal government. There was an increase in programmes at the municipal and county level. Since the Act had a five-year term [88], as early as 1958, voices were raised calling for its extension [11, 33].

The law was first extended and amended to 1962 and then to 1964. It sounds simple but it was not. Air pollution control was starting to become a political issue. The second extension was buying time. There were congresses, public sessions and proposals. In 1963, a replacement came about, The Clean Air Act. President Kennedy had initiated the new law; it was his successor Johnson who signed it. This law remained modest in terms of federal guidance, but, among other things, solved fiscal obstacles around research, provided procedures to settle interstate issues and had a much larger budget, sixty-five instead of five million US dollars.

The law was amended in 1965 with the Motor Vehicle Air Pollution Control Act, which for the first time imposed specific requirements on motorised traffic. In 1967, the law was amended again with the Air Quality Act, which further tightened standards, further structured enforcement, and intensified air quality and displacement measurements.

In 1970, the law was again amended. Until 1970, the laws had allowed much leeway for statewide initiative for interstate or regional cooperation and for developing legislation. For instance, the state of Oregon had legislated and enforced various forms of air pollution control in 1952. California picked up pace, for instance by adopting federal standards for car emissions in 1960. The other states were relatively passive but by 1970, all states had some form of air pollution control legislation [97]. The 1970 amendments broke with federal restraint.

From 1970, the federal government counted monitoring air quality across the nation as its responsibility. There was now explicit federal direction and federal coercion, national science-based standards came into force for state programmes as well as national emission standards for various sources. There was particular focus on car emissions, testing and certification. States were required to align their laws with federal guidelines and areas of focus. A new agency, with 1000

employees, was set up to administer the new law, the Environmental Protection Agency. The 1970 law had major implications for intrastate organisation, cooperation of counties, city-county collaborations and the implementation of management agencies. The law set an international standard and marked a broadening of perspective, namely to ‘the environment’ [28].

3 Citizens under stress

Many citizens called the police for help and explanations. From newspaper articles about the callers, a certain panic sometimes rings through [109]. In another article, this is also put into words “(...) many of the callers are near-hysterical and seek advice from health authorities on what to do (...)” [155]. The latter article was about people calling Pasadena’s Health Department. That “near-hysterical” is an issue for me.

For convenience, take two fictional Los Angeles City residents, call them Jack and Tess. In the absence of personal accounts, the following reflections on Jack and Tess are speculative. Jack went to work, came outside and was distraught for some moments. Jack was facing an untypical problem and did not know what to do. Jack, when asked about his position by an observer, might have said the following:

Problem Position 1 (Jack is considering calling for help)

1. *I can no longer see the end of the street, this is very scary. My eyes are burning and my throat hurts. I fear for my health and that of my family. These are my problems.*
2. *That stench and weird fog have to go.*
3. *I don’t know who is causing it.*
4. *I am not the cause myself.*
5. *I do not know what I can do myself.*
6. *I am part of the city of Los Angeles. The agreement is that the city council provides protection and ensures order.*
7. *I consider the stench and strange fog to be a danger and a problem of public order. The city council is therefore the problem owner.*
8. *The agreement between citizens and the government stipulates that I report problems to the government.*
9. *The police are part of the government and are the point of contact in these matters.*
10. *I could alert the police and ask for help.*

As an aside, the problem position above appears too in the companion article, as a single example of this kind of description. There Jack’s problem is typed as *acute threatening unfamiliarity* [176].

Enlisting help, such as calling the police, presumably brought back some calm. Jack may have thought afterwards, ‘it is not my problem now, I have handed it over.’ But I did not find any such expression in the sources.

The question probably occurs to the reader whether someone in a panic would react as dryly as suggested by me in Problem Position 1. It shows that a problem position is just a construct, here based on information from at least second-hand sources. Problem positions serve to get a picture of the depth, type of arguments and type of data used by parties having a problem. A complexity measure would be especially nice. This article serves to gain experience with the genre. For now, a good form requirement seems to be that a problem position appears plausible and complete to myself and the reader. Whether such a requirement is methodically sufficient in the long run remains to be seen. A discussion of the advantages and disadvantages I see follows in the Conclusion.

The police are part of a multi-layered hierarchical organisation. A structure that I refer to in general with the term ‘umbrella’ as done earlier [175]. Jack had called the police, with ‘him’ many others. Given the umbrella situation, I classify the action by Jack as *escalation*, a notion detailed further in the accompanying paper [176].

A party who is escalated to and who takes responsibility for an escalated problem creates obligations and that sometimes leads to disappointments. Some quotes to support these assertions from the case are: “If the people of this area expect the slightest relief, it will result only from protests so emphatic as to be heard and heeded” [154]; “Citizens in my district are enraged. Instead of this nuisance being eradicated it has been doubled” [110]; “They’ve been talking about it long enough, you would think they would have something to show for it” [61]; “(...) the use of chemicals (...). This is encouraging but the public will retain inclination to be shown” [153]; “New processes and machinery shortly to be installed by several big manufacturing concerns now running 24 hours a day give promise, Dr. Swartout said, that much of the smoke nuisance will be conquered within the next 60 days” [106].

Testing expectations back and forth over time whether they are met presupposes a memory. I call this memory the *problem accounting*, and it is part of the problem position.

I argue, the escalation that Jack committed changed his problem position and his problem to *controlled unfamiliarity*.

Note the + in the description below. Actions change problem positions, nevertheless, a current problem position will often contain many elements from predecessors. The problem position of Jack after he made his call contains viewpoints and facts from Problem Position 1. In order to keep the descriptions of problem positions concise, i.e., in order not to repeat too much, I use the ‘+’ to denote composition of problem positions where it is left to the reader to leave out the points from earlier problem positions that lost meaning or relevance. So + should be interpreted as ‘plus mutatis mutandis’. I expect that operations

on problem positions could be formalised more precisely, however, first we need to get some none trivial problem positions on paper.

Problem Position 2 (Jacks position after his call)

1. *Problem Position 1 +*
2. *I called.*
3. *The police declared the complaint admissible.*
4. *The city government and the county are now also working on it.*
5. *The government has taken responsibility and now has an obligation to me.*
6. *Will the government come up with a solution? I follow the progress, but if too little happens what do I do? Do I take action again!*

A police force or a government also has problem accounting. It is presumably a complex structure with its own problem dynamics. Professionalising it will presumably lead to an archive and procedures with it.

What was the non-caller thinking? There is not much explicit evidence on the psychology of the ‘non-caller’. In a newspaper report of 14 September 1943, an editor wrote: “The layman makes no pretense at being an authority on how to proceed, but on the folly of permitting this menace of fumes to continue he can give abundant first-person testimony. Whatever transpires today, the public wants assurances from its elected representatives that they are proceeding, determined to get relief at once” [151]. From another source it becomes clear that although the 1943 fumes were very bad, these were not totally a surprise. In 1942 and earlier years the phenomenon had popped-up [28, p. 40].

For hypothetical Tess I assume the following story. Tess had observed, after looking thoughtfully through her office window: ‘the traffic outside is flowing normally, there doesn’t seem to be any panic’. She had spoken to a colleague, who was also very worried. They concluded that although the stench and fog was worse than ever, they surely had also survived a similar fog in 1942. Ok, she thought, it doesn’t kill you instantly, fleeing was nonsense, but something had to be done! What could she do about this now? It will blow over, she thought. She resolved to look in the paper tomorrow and read what the authorities were planning to do about it. The problem position for Tess is similar to that of Jack and therefore I don’t to write it out. In the accompanying paper it is discussed what action, or solution, the non-caller could have picked [176].

4 The Los Angeles City Council

Below I try to reconstruct the problem position of Los Angeles City at the time when the escalated problems were still relatively fresh, say in early August 1943, and after the City’s board had declared the air pollution problems admissible.

Problem Position 3 (Los Angeles City, early in August 1943)

1. *Citizens are experiencing annoying smells and fog, they suffer from sore lungs and burning eyes, and they fear the loss of the 'blue skies'.*
2. *The public is also worried about health damage and wants answers.*
3. *We have accepted the public's complaints and administrative questions on the approach of lower authorities. We have a responsibility here.*
4. *The problems are due to air pollution caused in the region.*
5. *The lower authorities want help, direction and support in combating them.*
6. *What should we do now?*
7. *In the past, we could solve air pollution problems with a few targeted ordinances and technical interventions, the same will be true now. We suspect that a few large factories are the cause.*
8. *So, in short, there is no reason to panic or rush into rigorous interventions.*
9. *That is fine, because the region is growing, there is economic growth, we are important for the war industry, new industry is establishing itself here, many people are moving to this region. That success beams down on us. In doing so, we have no appetite for conflicts with powerful groups in society with whom we are now very well and on which we partly depend. Some of those groups have already taken a stand.*
10. *But, we are elected administrators, if we don't plausibly address the admissible issues we may lose our political credibility. And, of course, the questions about health impacts are quite understandable.*
11. *We could do the following:*
 - (a) *take visible action by which we buy time;*
 - (b) *ask the district attorney to shift its priorities to violators of air pollution ordinances;*
 - (c) *ask the county police to alert us to suspicious cases and enforce existing ordinances more vigorously;*
 - (d) *extend the powers of the district attorney where necessary;*
 - (e) *set up a committee to investigate the causes and propose longer-term interventions;*
 - (f) *ask the health department to investigate health risks in order to eliminate acute concerns.*

A year later, the positions had not changed substantially. On 15 September 1944, a long newspaper piece appeared entitled *City council balks at action to abate fumes* [105]. The city council discussed a motion by councilman Harby proposing to write to the appropriate authorities in Pittsburgh with the intention of finding out how this city had fought its “smoke and fumes” nuisance. Harby felt that local experts had clearly admitted that they did not know how to deal with the “smoke and fumes” and that help should then be sought elsewhere. In Problem Position 4, I try to reconstruct and abstract Harby’s position.

The motion met fierce opposition from councilman Rasmussen, the chairman of the Public Health and Welfare Committee. That committee was working on a proposal for legislation to combat the nuisance. Rasmussen said his committee was working on the basis of several studies already carried out and that studies were still ongoing. Corresponding with the named cities would not provide any new insights, according to him. He added that anything such correspondence might yield was already on file.

Harby countered that writing to colleague boards was obviously no advertisement for the board, but even if it made them only a little wiser it was already worthwhile.

Councilman Austin confirmed that unfavourable publicity was the reason the committee had not initiated such high-profile correspondence itself.

Councilman Holland called for the broadest possible investigative effort and expressed the hope that the final legislation would be the most stringent in the entire country. He also wondered what was more important now: the clean air for which Los Angeles had always had a reputation, or a few chemical plants. Finally, Holland contributed that he was under the impression that the public thought smog was not being fought because the city government did not want to bother the war industry.

The proposal to write to the other cities was adopted. But, the journalist surmised, because Rasmussen had to implement it, the proposal had practically crashed.

Problem Position 4 (Harby)

1. *I am fellow board member of umbrella X.*
2. *We have a problem p.*
3. *Problem p is new to us and we do not yet know what to do with it after quite some time of study.*
4. *We see p as a problem of type T.*
5. *Others, $Y_1 \dots Y_n$, have successfully fought problems of type T.*
6. *We can learn something from them.*
7. *That requires us to make contact with them.*

8. *Making contact with $Y_1 \dots Y_n$ we cannot hide from the public.*
9. *The action will reveal our helplessness and thus potentially generate negative publicity.*
10. *I think learning something is more important than the fear of negative press, so let's make contact.*

Here, p stands for Los Angeles smog, X for Los Angeles City, T for air pollution in general, $Y_1 \dots Y_n$ for Pittsburgh, Memphis and other cities. Rasmussen had the following abstract problem position:

Problem Position 5 (Rasmussen)

1. *I am fellow board member of umbrella X .*
2. *We have a problem p .*
3. *p was new to us and we didn't know what to do with it.*
4. *p is a problem of type T .*
5. *Others $Y_1 \dots Y_n$ have successfully fought problems of this type T' .*
6. *T and T' belong to the same category of problems.*
7. *Of course, it is interesting to know what they have done.*
8. *But, we have conducted research and we have and know the right reports. We know what $Y_1 \dots Y_n$ have done.*
9. *T overlaps with T' but also has characteristics of its own. For that, research is ongoing.*
10. *We cannot learn anything more from them by once again requesting information through their boards.*
11. *The plea to contact $Y_1 \dots Y_n$ means you have no confidence in me.*
12. *If a fellow board member doubts my claims: come along and convince yourself, we have all the information about the others available and inventoried.*
13. *I suggest: my committee finishes the plan it is already working on and then we will implement it.*

Austin's position was not fully clarified in the piece cited. If we assume that his problem position is similar to Rasmussen's. Then the difference is that Austin revealed that negative publicity was a reason to gather information about other cities with air pollution problems through the back door. This then brings me to the following position:

Problem Position 6 (Austin)

1. *Problem Position 5 +*
2. *We have gathered the information on the approach by $Y_1 \dots Y_n$ through the back door in order not to reveal our helplessness and thus avoid the risk of negative publicity.*
3. *I suggest taking Rasmussen's approach.*

I interpret Councilman Holland as follows:

Problem Position 7 (Councilman Holland)

1. *I am fellow board member of umbrella X.*
2. *We have a problem p.*
3. *Problem p is new to us and we do not yet know what to do with it after quite some time of study.*
4. *We see p as a problem of type T.*
5. *Others $Y_1 \dots Y_n$ have successfully fought problems of type T. We can learn something from them. That requires us to contact them.*
6. *Fellow board member m_1 with Problem Position 4 fears negative publicity as a result of making contact because it reveals our helplessness. I don't see that problem. I think the public's view is that we let p continue so as not to jeopardise the war effort. People understand that I think. We have time.*
7. *Fellow board member m_2 with Problem Position 5 says he already knows everything there is to learn from $Y_1 \dots Y_n$. I think we should do the maximum to gather information so that there is no doubt about our commitment. Asking help from fellow directors may give different insights than collecting technical reports from their staff. To the public, such a request to fellow cities is the obvious thing to do, so not doing it would cause a negative public reaction.*
8. *We are lagging behind in fighting p. We need to catch up, so our approach must go further than others.*
9. *I wonder if p can be solved with an intervention that leaves our view of the world untouched. Perhaps we need to hold past choices up to the light and p can only be solved by undoing those choices and taking different paths.*
10. *I suggest we get in touch and also reconsider our assumptions.*

Holland brings in, I think, four elements that I consider noteworthy. First, assertion 6, in this assertion p is subordinated to another, bigger, problem. Second, assertion 7, in this Holland says that openness about the lack of a solution combined with maximum effort to reach a solution will be viewed positively by the public. Especially if it is such an obvious step, one that the public could have thought of on its own. Thirdly, assertion 8, this I believe is a familiar sentiment to assuage the conscience: ‘we are falling short, but we are going to make up for it by doing more than $Y_1 \dots Y_n$ ’. Fourth, assertion 9, this is a *backtracking* proposition: analysis of the problem situation leads to questioning previous choices [16].

I see *figures* in many of the arguments in the above. It’s a term, derived from choreography, that I use for patterns of actions and reactions that appear familiar and suggestive, that need attention, but at the time of writing can not be elaborated. There are many figures. Take the efforts to establish qualifications for “fumes engineers”, page 4. I think this is typical for the Los Angeles situation of 1944 to introduce such a role, even if it’s provisional. The discussion on the qualification of such an engineer is also typical, I think. The government tries to make sure it gathers reliable data, but also the parties scrutinized by such engineers want to be taken seriously. Of course, qualification lead to discussion, recently there was doubt about the qualifications of the DOGE workforce [29].

The newspaper article suggests that councilman Holland spoke at the end of the meeting and stated his position. That is plausible, after all, the material for his position first had to be voiced by others. I suppose many thought constructions in positions arise incrementally. So enlisting help (from, say, Pittsburgh) is the initial idea. With that, a new consideration arises: if you can do something, you can also not do it. Both options are mentally weighed in relation to other considerations and elements in the problem position. Then the realisation arises: ‘aha, the image of our professionalism as a board may be dented’. If dilemmas come into focus step by step in this way, the question also logically arises as to whether previous starting points and assumptions may not (no longer) be correct. This brings to mind the work of Kahneman et alia and of others, in which it is shown that people try to put together a plausible story based on scarce information [40, 86]. You can see it happening in this meeting. For Aggregation Dynamics, it does not matter whether such a story is plausible, or who is right. It may even be a lie or bullshit [31]. For Aggregation Dynamics, it is about the complexity and involvement of the claims in relation to the aggregations it concerns, whether they are affected or manipulated by it.

5 A public meeting in Pasadena

On 1 October 1946, there was a noisy public meeting at Pasadena City Hall. The participants included some 300 citizens, representatives of various interest groups, such as the Pasadena Chamber of Commerce, some Pasadena and county

board members and some experts employed by the government, such as Isador A. Deutch of the county [62].

A whole number of citizens came to speak and they expressed emotions, made threats and gave arguments. Taking these together and assigning them to a fictional Pasadena resident yields the following problem position:

Problem Position 8 (Pasadener at the meeting)

1. *My property value is decreasing.*
2. *I have health problems due to smog.*
3. *Factories in Terrence, Vernon, El Segundo, Long Beach and Los Angeles are the cause of smog.*
4. *The boards of those places, the Pasadena board and the county board are not doing enough against smog, they are letting us down.*
5. *Elections are coming up, if something doesn't happen soon we will vote out the current administrators.*
6. *We should seek help from the State Health Department, they may be able to establish quarantine zones.*
7. *I am considering moving periodically and perhaps leaving permanently.*

Deutch and the county supervisors had become convinced that a joint approach was needed to combat smog. I phrase their problem position as follows:

Problem Position 9 (County)

1. *We do not know what substances cause the sore eyes, but that they are there is undeniable.*
2. *The foul air lingers due to a meteorological phenomenon, we do not yet understand.*
3. *Our problem is different from midwest and eastern industrial cities, we have much less soot and dirt in the air.*
4. *We are systematically working on the problem and getting wiser, for instance, several studies are underway at two universities.*
5. *We know of many polluting factories, but we do not have sufficient authority to intervene.*
6. *The city of Pasadena can do little itself.*
7. *The county has capacity and expertise and has offered to enforce for free in cities based on a model ordinance, but only six cities have accepted the offer.*

8. *Pasadena has not accepted the offer either.*
9. *Given this state of affairs, the county thinks it has to become a “smog abatement district” in the field of smog control, which seems to be the only fruitful path for the approach.*
10. *Then the approach will still take years, so be patient, we are trying our best.*

Pasadena board chairman Robert E. Dawson defended the decision regarding the model ordinance:

Problem Position 10 (Dawson)

1. *We did not accept the model ordinance.*
2. *Because, enforcing here does not help, the foul air comes from elsewhere.*
3. *The model ordinance has drawbacks. For instance, it states that private rubbish burning should be restricted.*
4. *We think private rubbish burning is not going to make a difference.*
5. *Banning private rubbish burning is disadvantageous and impractical for our citizens.*
6. *We have studied the issue thoroughly.*
7. *We are on top of it.*
8. *We have decided that a smog abatement district is the solution.*

Colonel Charles Ketterman, a county official, stated the following:

Problem Position 11 (Ketterman)

1. *Tackling factories could mean people will be out of work.*
2. *County authorities and experts need time to understand the problem.*
3. *The public needs to be patient for a while.*

I suspect Ketterman was counting on the whole problem being solvable with some clever interventions. He presumably hoped for a ‘quick fix’.

6 The Los Angeles Chamber of Commerce

The Los Angeles Chamber of Commerce rebutted, on 10 October 1945, the suggestion that it was apathetic and that it feared that anti-smog measures would cause the industry they had ushered into the area to leave again [49]. They indicated that they were keen to cooperate and collaborate, and they were already showing that through their Smoke and Fumes Committee. This committee consisted of industrialists, technicians and representatives of city and county governments. Deutch, for instance, was on it. In early 1947, the Chamber called for a voluntary programme to support city and county efforts as an extension of the Smoke and Fumes Committee's duties [126]. It was a final attempt to bypass Assembly Bill No. 1 [28, p. 86]. Combining the communications over the years, their position in early 1947 might have been as follows:

Problem Position 12 (The Los Angeles Chamber of Commerce 1947)

1. *The Chamber of Commerce represents the industry.*
2. *Members of the Chamber and the Chamber itself want to operate within the law.*
3. *For industry members of the Chamber, smog is also a concern.*
4. *We take smog seriously.*
5. *It cannot be ruled out that our industry contributes to air pollution.*
6. *But so do others, for instance citizens who burn trash improperly.*
7. *The member industry is doing great in this region. Affiliated industries are turning bigger and bigger turnovers and profits are rising.*
8. *That beams down on us. We as a Chamber are important, we are feted, we are seen, we have power.*
9. *Prosperity is growing not just for us, but for everyone.*
10. *All this good fortune is possible because of Free Enterprise.*
11. *The government wants to impose rules on us to combat air pollution.*
12. *We have several objections to this:*
 - (a) *Rules erode our position of power, as an industry, as a Chamber.*
 - (b) *If we need to improve something about our processes, we should pay for it out of our profits.*
 - (c) *The government should not interfere with free enterprise.*
 - (d) *We know our production processes best ourselves.*

- (e) *The government cannot tell us at all how to make or modify things, the government does not have that knowledge.*
- 13. *We do need the government to regulate some basic things.*
- 14. *We want to prevent the industry we brought here, which gives us a lot of status and income, from leaving again.*
- 15. *We don't want to make new industry considering settling here uncertain.*
- 16. *How do we keep the government out? The solution is a three-step plan: point to the war effort in the short term; then buy time with research on research; and finally, if nothing else, work towards voluntary agreements.*
- 17. *We see that last step this way:*
 - (a) *We set up a team of technical advisers. The people for it come from makers of equipment to control emissions, the industry itself and local universities.*
 - (b) *We set up a subcommittee within the Smoke and Fumes committee for each category of industry that could be the source of smoke, smells, odours, dust or noise.*
 - (c) *To develop reliable information on average conditions, members of the technical team conduct field inspections.*
 - (d) *With the information from the field inspections, the team of consultants arrives at a recommendation on appropriate abatement methods. The subcommittee of the relevant industry goes on to address and, if possible, implement these recommendations.*
 - (e) *Knowledge sharing between industry committees is promoted.*
 - (f) *The effort is led by the Chamber's business service department thereby advising and being advised by the Smoke and Fumes Committee.*
 - (g) *The services are offered voluntarily and free of charge.*
- 18. *With the above, additional legislation and interference of authorities in our affairs is unnecessary. We can tackle our emissions ourselves.*

About this problematic position, can be said that it may have been contaminated by insinuations by journalists from the cited articles. Was the Chamber's position so laced with self-interest? That is not implausible. But is it likely that the Chamber was so showy with its self-interest? Asked about their problem position, noble motives may have been at the forefront?

If so, then it seems useful to refine the terminology and speak of an *internal* and an *external* problem position. Problem position 12 then I suspect is near the internal. The external is the sales pitch.

It does not seem impossible to get a good picture of the external problem position. It may have been published in a public report, for example. The internal problem position is harder to reveal. What does a party want to say about

it? How well does a party know itself? Perhaps there is another refinement useful for the discussion. The *natural problem position* is then the ideal internal problem position. Ideal in the sense of complete and pure. However, complete and pure does not yet mean correct or truthful.

I do see the truthfulness of problem positions as a relevant issue. For example, what is the cumulative effect of misrepresentations, whether lies or a concealment of intentions, in a problem propagation [31]? It also touches on the fundamental question of the extent to which one can know reality. For this paper, these questions are beyond the focus. Let's go back to the elaborations.

Standing out in the position is a principled view, an axiom you might say perhaps: central intervention by the county comes at the expense of free enterprise and earning power, so you shouldn't do that.

At last, the Los Angeles Chamber of Commerce was silenced by the State Chamber of Commerce. It could be that the State Chamber saw that something had to be done, and then it was better that in terms of measures, a level playing field was created? To me, that does not matter. What does matter is the observation that this familiar argument was used. In *Don't Breathe the Air*, an industry spokesman is paraphrased. He had argued that the model ordinance "unfairly singled out industry and would put Los Angeles' industry at a competitive disadvantage during the postwar period" [28, p. 86]. So, I assume the level playing field argument indeed played a role.

7 *The Los Angeles Times*

In an editorial from the 26 September 1946 issue of the Los Angeles Times under the title 'The Shame of the Smog', the following elements come together [122]:

Problem Position 13 (*The Los Angeles Times*)

1. *I am an editor of The Times.*
2. *In an editorial commentary, I can give my take on a social situation.*
3. *Smog is a big problem for residents in different parts of the county.*
4. *The district attorney is doing its best but is getting bogged down. Because ...*
 - (a) *It is often the case that those inconvenienced by air pollution fall under a different administrative unit from those causing it. Thus, they reside in geographically different jurisdictions.*
 - (b) *Voluntary cooperation of polluters in the situation outlined under point 4a is scarce. An attempt to do so through a model regulation can be considered unsuccessful.*
 - (c) *The legal options in the situation outlined under points 4a and 4b to bring polluters to reason are limited or time-consuming or uncertain in terms of outcome.*

5. *Meanwhile, the situation under points 4b and 4c appears to seriously complicate smog control.*
6. *The solution is to use the state to force the obstructing parties to cooperate.*
7. *The city of St. Louis also suffered from smog, it was perhaps worse than here. This city had similar problems and inadequate smog control due to administrative procrastination and obstruction by some stakeholders.*
8. *A concerted approach brought great improvement in St. Louis.*
9. *This joint approach did not come naturally: the population forced change through large protests.*
10. *Public anger is also on the rise here.*
11. *I think the boards need to understand that patience is beginning to run out.*

The view of *The Times* is nuanced, gives pros and cons, and a plan of action. The time of publication is a few weeks before *The Times* took a position in the debate, see Section 2.1.

The gist of the position is, as before for the county: all parties are both perpetrator and victim → we need to work together. It also appears that there were parties who were obstructive or uncooperative. I discuss the problem position of some of them in the next section.

8 Discord

I work out some problem positions of parties in Los Angeles County in the years before Assembly Bill No. 1 was introduced. These are some of the parties that were silent, uncooperative or obstructive. These problem positions are covered in Sections 8.1 to 8.4.

I searched for different positions on the cross-border air pollution issue. It's not clear whether what I found is representative for the salient problem positions of all forty-four administrations aimed at by the county's model ordinance. On some of them hardly anything can be found on-line that relates to the smog fight. But, what I found matches the main conflicts described in the books and editorials in *The Los Angeles Times* and vice versa. That gives some reassurance. In general, I expect problem types, repertoire and their contexts, i.e., problem positions and situations will need to be constructed from observations from a multitude of cases.

The positions appear to vary widely. Nevertheless, the core issues boil down to a small set of familiar concerns I think: burden sharing, task sharing, autonomy, control, and level playing field.

8.1 Long Beach

Long Beach had several local daily newspapers. Below I reconstruct some arguments and views from these. In doing so, I noticed that the number of articles on smog was relatively modest, that the articles were mostly short, and that they were not on the front page. For what it's worth, this fits the picture that a party like Long Beach perceived smog problems as less urgent.

In January 1945, Long Beach attorney Irving M. Smith and city manager Samuel E. Vickers considered a version of a “[county] smoke and fume abatement ordinance” according to a small article in the *Press-Telegram* [43]. The article does not convey the impression that the men were very enthusiastic:

It is understood that many of the odors and fumes which permeate Long Beach are from canneries as well as from nearby refineries. Officials doubt that cannery odors, under certain weather conditions, can be satisfactorily controlled.

Those canneries canned fish. Based on this one article, the problem position of the Long Beach board members may have been this:

Problem Position 14 (Long Beach, January 1945)

1. *The factories that are canning fish spread odours.*
2. *Depending on the direction of the wind, those odours blow into the country.*
3. *We don't think we can do much about those odours.*
4. *There are also smells from refineries blowing further into the country via Long Beach.*
5. *We have no control over those refineries.*
6. *It's not all that bad.*
7. *The whole model regulation is a bit high-minded.*
8. *The smells are the result of our economy and prosperity, we are best to accept the situation as it is.*

On 25 February 1945, Basil E. Leever, presumably an editor, wrote an article with some local commentary in the *Press-Telegram* [42]. He reported that Swartout had been appointed and tasked with drafting an ordinance to regulate “smoke and fumes emissions by factories, dumps and other sources”. If the fish canneries turned out to fall under those other sources then Long Beach had to be eternally grateful. That's quite another take on the issue.

Problem Position 15 (Basil E. Leever, Februari 1945)

1. *Perhaps certain guidelines and requirements for our city are going to change, as there is talk of a “smoke and fumes ordinance”.*

2. *I cannot oversee how these interventions would work out for us.*
3. *But, if one consequence is that the “fish canneries” have to address their odour emissions, that would be “a big step forward for Long Beach residents”.*

The discussion babbled on. On 11 October 1945, the *Press-Telegram* reported that city prosecutor Albert C.S. Ramsey was going to crack down on fish canneries, many residents had complained. It also reported again on the model ordinance [71]. On 22 January 1946, the *Press-Telegram* reported that the county was planning six large “incinerators” to improve waste incineration. One was planned in Long Beach. Waste incineration was a great topic of discussion within the county and in the model ordinance. But this article did not make that link or take a position, it is simply a notice [77]. On 8 May 1946, the *Press-Telegram* reported that Vickers and City Health Officer Harrison Eilers had visited the Los Angeles supervisors and that they wanted to cooperate with the ordinance [75]. On 10 May, it was again confirmed that Vickers and Smith were in favour and also that 26 cities had at that time said they wanted to introduce the model ordinance. Apparently, the county wanted to start certain tests in those cities. Long Beach could join in those tests once they accepted the model ordinance. On 24 May 1946, the *Press-Telegram* reported that the county ordinance, if adopted, would be enforced by the county and salaries would be paid by the county [72, 81, 94].

I find this testing interesting, and also that the county wanted to take on the operation and the cost. With that testing, one hand washed the other, everyone became wiser. It is conceivable, I think, that spring 1946 a majority of these ‘26’ had a problem positions as follows:

Problem Position 16 (Long Beach and others, spring 1946)

1. *We are accused of causing smog.*
2. *We don’t want to completely rule out contributing to the smog problem.*
3. *There is dirty air blowing in from elsewhere, we are not the cause of everything. We would also like to know what blows in to us and where it blows to.*
4. *So it would be good to know exactly what everyone is contributing to smog right now. Ourselves, but also our neighbours, their neighbours, and how it all spreads.*
5. *A solution to the ambiguity could be testing in all cities.*
6. *The county offers to do those tests, advise on measures and enforce. So it does not cost us anything.*
7. *On these grounds, we are not unwilling to participate in the model ordinance.*

But, Long Beach still needed more time to reach a decision. On 20 July 1946, the *Press-Telegram* reported that Pasadena was in favour of an ordinance imposed through the state [79]. On 11 October 1946, it was reported that Vickers was still in favour of the ordinance and wanted to cooperate, but the city council had not yet made a decision. The title spoke of ‘antifumes’ [73]. That term had been already abandoned elsewhere for the negative ‘smog’.

On 14 October 1946, more positional aspects came to light [73]. The title spoke of ‘antismog’. The Long Beach city chemist and the city prosecutor had yet to issue an opinion. The city council was waiting for that. There was clearly disagreement in the board. One councilman doubted Long Beach’s contribution to the issue. Another councilman disputed that while pointing to the refineries in Long Beach. One discussed the interpretation given to the model ordinance by the city of Montebello. Montebello took on certain tasks from the model ordinance, i.e., they cooperated with the county but they did not completely hand themselves over.

What I gather from this bit of reporting is that people started taking the problem more seriously. ‘Fumes’ became ‘smog’. There was no more vagueness about the refineries, which were in Long Beach, not ‘nearby’ as the quote on page 35 put it. It also becomes clear to me that giving up autonomy was a sensitive issue. That Pasadena was in favour of a state imposed law was felt by Long Beach as a serious threat. Long Beach figured the Montebello approach of the legal issues could work for Long Beach too.

Problem Position 17 (Long Beach, October 1946)

1. *Problem position 16 +*
2. *Yes, those refineries are in Long Beach. We also contribute to air pollution in the region.*
3. *We find it unpleasant to give up autonomy.*
4. *So getting a law imposed on us through the State of California is not a good plan.*
5. *There is something that needs to be done, though.*
6. *Introducing the model ordinance but observing certain tasks ourselves as Montebello could be a nice middle ground.*
7. *A disadvantage is that we would have to bear more costs ourselves.*

The discussion continued. On 17 October 1946, the *Press-Telegram* reported that Eilers was in favour of the ordinance the city counsel was considering at the time. The objectionable stench of canneries was already covered by an ordinance, but other sources of smoke and fumes were not. Incidentally, most smog came from elsewhere was once again stated [74].

On 11 November 1946, the *Press-Telegram* reported that a county air pollution control officer had said fish cannery odours could be easily controlled.

He tried to calm fears that the county would come up with punitive measures, the county's modus operandi involved an instructional programme. It was reported that nine cities had adopted the ordinance, Long Beach, however, still did not [76]. On 21 November 1946, the *Press-Telegram* reported succinctly on a "meeting of the California League of Cities" in Pasadena. County counsel Harold Kennedy had discussed there the implementation of the ordinance with concerned. Long Beach attended, one had meanwhile agreed [80, 78].

From the above, I think it is clear that the abandonment of autonomy ran deep. People did not want to be dictated to by the county. Various problem positions have been presented in the above. What is the tenor in them? One could say that the problem position in early 1945 was one of: there is no substantial problem, so we do nothing. In late 1946, the problem position was similar to that of the county and other parties who recognised shared responsibility and favoured cooperation.

How did other cities fare? We briefly review some reports on Burbank, South Gate and Santa Clarita.

8.2 Burbank

The county had initiated legal proceedings in October 1946 against a number of factories in Burbank, including an asphalt plant owned by the city itself. The city manager of Burbank, Howard Stites, had it recorded that their asphalt plant made no smog, 'well maybe 10 minutes at start-up in the morning'. The steam the plant made then was mistaken for smoke he supposed. According to him, the smog came from the industrial district located in southeast Los Angeles, not Burbank [169]. Burbank was in the process of formulating and accepting its own version of the model ordinance. Board members in Burbank were outraged that while they were conforming to the county's wishes, legal action was being taken against them and the city's industry. They found it improper that they had to learn about the legal action through the newspaper. At the same time, they did not see much problem as the factories and the city were eager to cooperate.

There was confusion over the order the county was following. At a meeting, Stites had understood that inspectors warned first and only initiated proceedings if there was no adequate response. Deutch had responded by saying that this was indeed how the county operated, but in the case of the asphalt plant, the district attorney had initiated proceedings based on a state statute. Asked about this, the district attorney confirmed this reading: procedures were initiated immediately upon the discovery of a violation, but they allowed room for the defendant to take timely action [170].

There are not many reports with discordant arguments between Burbank, the county and other cities. Burbank was one of the parties that sat back to wait and see. In late 1946, they believed they should just conform to the county's wishes before it was going to be imposed.

8.3 South Gate

The *South Gate Daily Press-Tribune* reported on 23 November 1946 on the aforementioned meeting of the California League of Cities in Pasadena. Harold Kennedy had told there about the next step the county was preparing, which was to become a district through the state. At that time, South Gate was one of the cities that had not yet adopted the model ordinance [92]. On 2 December 1946, a South Gate newspaper reported: “South Gate will join the ranks of other Los Angeles County cities who have an air pollution control ordinance on their books” [91]. Councilman Francis Bunnett said South Gate had not signed earlier because the county did not have the ordinance ready until then. He found that the consistent blame the county expressed towards administrative units in the county for not cooperating was unjustified because there was no ordinance at all. Now that there was, South Gate would readily agree.

There is a familiar figure in this little piece of history about South Gate I think. Opinion on the role of the county and the model ordinance began to turn. Whereas before it was accepted to look away, now one ran the risk to get publicly exposed if one did not participate. The South Gate board members acted as if they had always been in favour but that the county had failed to come off with the model ordinance. Interpreting it freely, I think the internal problem position was the next in late 1946.

Problem Position 18 (South Gate)

1. *We South Gate officials have long downplayed the smog problem.*
2. *Meanwhile, we also see that the problem is serious and only a concerted approach will work.*
3. *Our own people are also beginning to complain and grumble about air pollution.*
4. *Public opinion is starting to turn against us.*
5. *Keep up the aura of decent and responsible governance, we pretend that the county just did not come up with the right documents.*

8.4 Santa Clarita

A different take on the smog issue offers *The Signal*, a Santa Clarita-based newspaper. This place lies safely behind a mountain range 50 kilometres northeast of downtown Los Angeles. No serious article can be found on air pollution between 1943 and 1946. The word smog or fumes does occasionally fall, but as a problem from afar. A Santa Clarita editor made fun of “the great city of Los Angeles” that was getting into trouble, of the commission that had studied the problem for 16 months and had been dismissed, of Swartout who was now allowed to try to do the job. If the “Angelenos” wanted to see the sun and breathe fresh air they were invited [163].

Problem Position 19

1. *I, columnist of The Signal, hate Los Angeles.*
2. *The Angelenos are always lecturing us and imposing their will on us.*
3. *Nice, now they're in trouble with all their factories.*
4. *They may solve that air pollution themselves. It's not our problem at all.*

Although the basis for far-reaching conclusions about Santa Clarita's problem position is thin, I think a familiar figure can be recognised here, namely blinding Schadenfreude due to resentful feelings. I suspect they maintained that position until it was all decided for them.

9 Conclusion

This article aims to do two things. First, it applies the notion of problem position to an extended case. A problem position is an informal description of how a party perceives a certain problem, how it intends to address it, and what considerations and data are considered relevant in doing so. Examples of elements in it are: past and present data, opinions of others, relevant standards, plans, arguments, scenarios, experiences, knowledge, methods. The notion of problem position was introduced in [175]. Second, air pollution abatement in Los Angeles County in the period 1943-1976 is a very rich history. Rich in the sense that I believe there is a lot of material to be extracted from it for aggregation dynamical considerations. It is, I think, true that is every history or current event is suitable for an aggregation dynamic reflection. But this history stands out, I feel. It is linked to major current issues such as environmental pollution and climate change, moreover it's filled with technical developments, such as the three-way catalytic converter, unleaded gasoline, electric traction, and organisational shifts. Just a lot happens in it.

The history as described in this article is full of hooks for follow-up case studies. Take, for example, the positions from Long Beach to Santa Clarita. Those bear similarities to floundering parties in other unification processes, for example within the European Union. It takes a lot of text, but it has to be described somewhere and be traceable to a reader.

This article forms a diptych with another article [176]. There, the same history is studied, but the focus there is on types of problems and solutions; the case history is presented condensed in it.

Back to the present article. This article is the first to apply the notion of problem position on any scale. What did I learn from it?

Eight points strike me about working with problem positions. First, I note that other authors have also worked on descriptions that I classify as problem positions. Dewey wrote: "I have sought to let ordinary citizens discuss the problem and describe their experiences in their own words as much as possible, to illuminate the process of the public discovering and trying to comprehend

and confront a complex environmental issue.” See Appendix A for more on his work. Like Dewey, Thomas C. Schelling also tried to systematically put himself in the shoes of actors. He called this the *vicarious problem-solving* method [87]. This method appears to aim at texts akin to problem positions. That these authors were working with similar notions is reassuring; problem positions do not seem like an out of the blue concoction.

Second, I do not find the content of the problem positions described very surprising. All the arguments I describe seem familiar to me. That gives some confidence given the longer goal of finding patterns in them. It’s what one expects given the Innovation Illusion.

Third, the representativeness of the collection of problem positions is doubtful I guess. I tried to select problem positions at turning points in history, for example, that of the Los Angeles City administration at the time when, August 1943, they had no idea what was happening to them. That is Problem Position 3. Or, the Chamber of Commerce in Problem Position 12 as they flounder to try to stem the Assembly Bill No. 1 tide. Furthermore, Moreover, I have looked for contrasts and instances where parties refer to each other, which is eminently seen in councilman Holland’s Problem Position 7. Finally, I worked out problem positions belonging to particular problem types. The whole series of positions from Long Beach to Santa Clarita belong to the inventory of the repertoire of problem type discord. I imagine I could later compare these with a case of discord in a totally different situation. Nevertheless, the choice of elaborated positions is also somewhere arbitrary, there are many other and presumably equally interesting problem positions. I don’t think the chosen selection of some 20 problem positions covers the entire search space of this genre in any representative way. Anyway, you have to start somewhere.

Fourth, D. Colander reproached Schelling with saying that vicarious problem solving is too non-committal and private [22]. That there is a weakness there is a feeling that also creeps up on me when describing problem positions as I do. There is always distance between the describer and the described and a lack of documentation. The problem positions presented in this article are nothing more than reconstructions based on second-hand information at best. It seems plausible that if I describe a problem position based on interviews with a person involved that it will be more complete. But, that is not unproblematic either, as I will discuss further below.

Similar criticisms already surfaced in the argument when I argued that one might need to distinguish: a *natural problem position*, an *internal problem position* and an *external problem position* (see Section 5 and Section 6). The ideal problem position would then be the *natural problem position*, the complete picture, but not even the problem owner knows it, given the role of the subconscious. The internal problem position is what the owner finds for himself and the external problem position is the possibly twisted version for the outside world.

Anyway, studying problem representations is about decisions and interventions made by people on an ongoing basis. How critically are these scrutinised and checked for errors? Not that deeply I think. I think the problem positions

I have described seem quite plausible and realistic. I feel they correspond to what people experience every day and read in the newspapers or hear on the radio. It might as well suffice, we'll see.

Fifth, following on from the twisting of a position by a party mentioned in the previous point, problem positions can be layered and contain gross lies. Examples of this I have not given. But some contortion can be read in, for example, Section 2 where it was recounted that the Los Angeles Chamber of Commerce had responded saying that by doing so precipitously would jeopardise the war effort. Did they really mean that? I doubt it. It raises the question of whether truth matters when studying problem propagations. Is some kind of validation needed besides a party's problem position? I don't have an answer to that right now.

Sixth, the problem positions I describe are pedestals snapshots. What people think about something is constantly changing. That suggests the risk that the crucial moment in a process may be missed. At the moment, I think that having the ability to visualise exactly the timing of causal relationships is not that relevant to the development of the theory.

Seventh, where to stop describing? For instance, when it comes to background knowledge, or alleged background knowledge, many claims are based on implicit unnamed other claims. Should I elaborate those too? Suppose I were to work out problem positions of Arie Haagen-Smit and an opponent at Stanford University. A problem position working out the whole of organic chemistry is conceivable, but obviously unworkable. Here parallels arise with the danger of over specification when using design tools in systems engineering, such as drawing techniques in architecture or specification languages for software development.

Eighth, the problems from the previous point become even more complex for composite parties, that is, for aggregations in the broad sense. That aspect had been deliberately swept under the carpet for a while in the previous points. For example, 'the police' do and think nothing, it is an aggregation and an emergent phenomenon. But, 'the police' do get assigned positions in everyday life.

What can I conclude from the above eight considerations? There are, I think, three aspects to consider: the usefulness of problem positions, their definition, the method of description.

With the exercise in this article, I find that I can ascertain that problem positions are useful for unravelling problems and solutions, it provides readable contexts, albeit rather boring. Other uses of problem positions could be the inventory of arguments, quantifying the depth or involvement of a problem position. To what extent is a problem position a gamble? Nothing can yet be said about such utility based on the preceding exercise as it was not performed.

Which text is a problem position and which is not? Clear criteria I do not yet have. With the above discussion, some contours may come into view. However, I think there is no point in striving for an a priori definition. The requirements will have to become clear as we go along, in application.

The same applies, I think, to the methodological side. The natural problem position is unattainable. At most, I can try to approach the internal and the

external. Interviewing seems to be the route for that, but interviewing is not neutral. The interviewer can give the interviewee new thoughts. And, the interviewee may simply hide certain considerations, or present them in a distorted way. Where you end up between internal and external problem positioning is impossible to say. One way out might be diaries, or letters or emails to confidants. But, these are hard to trace. To illustrate, in Section 3 *Citizens under stress*, the rhetorical Jack and Tess were followed. I searched online for diaries but found nothing.

In short, for now, I see no reason to stop describing problem positions. For subsequent case essays, I can imagine taking the following steps.

A next test could be to interview someone about an issue, distil a problem position, and then ask the interviewee whether the description is complete. Or, someone else could try to reconstruct, unburdened by the aggregation dynamical style, the problem position, this time from newspaper reports or other sources.

Another test could be the deployment of a formal language [15]. That might make describing and comparing positions more precise. Some tentative steps in this direction have already been experimented with in the previous section. For example, in Problem Position 4 and Problem Position 6, variables have been used and problem positions have been conceived as sets of statements to which you can add or omit something.

A third test, finally, might be to simply carry on. So, describe the problem positions as I have done in this paper and then use them, as intended, to answer two questions. What type of assertions do parties use? How involved are problem positions in relation to the community of conditions from [175]? And, look at the findings as statistical evidence. Regarding the first question, a comparison with argumentation theory may be practical. For the second question, the Los Angeles smog case is presumably too wide-ranging; it requires a simple issue, to begin with. Of course, it may turn out that these applications are not hampered by sloppily formulated and incomplete problem positions, and that the whole discussion of definitions, natural, internal and external problem positions is unnecessary.

As my argument progressed, a number of figures were noted. In councilman Holland's (Problem Position 7): making up for mistakes made with the promise of future extra vigorous action. South Gate looked away when most cities did, but when the tide began to turn they said they had always been ahead of the game and the excuse was that the county was slow with the model ordinance (Section 8.3). Santa Clarita seems to be a case of Schadenfreude-induced inattention; they were not paying attention and it was decided for them (Section 8.4). Finally, the fumes engineers, see page 4, fit into a pattern in the sense that in problem situations often new experts pop up, with a dedicated names, and accompanied by a discussion on their qualifications.

Acknowledgements

Thanks to Jos van Wamel and anonymous reviewers for their comments on earlier versions of this article.

References

- [1] Ed Ainsworth, *Divided Opinions on Smog Control Complicate Issue*, The Los Angeles Times (1946), no. November 5, pp. 11 & 22.
- [2] Ed Ainsworth, *Fight to Banish Smog, Bring Sun Back to City Pressed*, The Los Angeles Times (1946), no. October 13, pp. 1 & 7.
- [3] Ed Ainsworth, *Smog Hunted by Expert From Law Libraries to City's Laboratories*, The Los Angeles Times (1946), no. December 21, pp. 1 & 3.
- [4] Ed Ainsworth, *Thirteen Suits to Be Filed in Smog Fight*, The Los Angeles Times (1946), no. October 15, pp. 1 & 2.
- [5] Ed Ainsworth, *'TIMES' BRINGING SMOG EXPERT HERE*, The Los Angeles Times (1946), no. December 1, p. 1.
- [6] Ed Ainsworth, *Smog Controller McCabe Arrives to Assume Duties*, The Los Angeles Times (1947), no. October 2, p. 15.
- [7] Ed Ainsworth, *Supervisors Pick Chief for Smog Fight*, The Los Angeles Times (1947), no. August 27, p. 1.
- [8] Ed Ainsworth, *CAUSE OF SMOG'S EYE SMARTING TOLD*, The Los Angeles Times (1949), no. February 26, pp. 1 & 12.
- [9] Joseph Alsop, *Is McCarthy Kidding About Smog Control?*, Pasadena Independent (1960), no. 26 July, p. 7.
- [10] Associated Press, *Industrialists Enter Defenses*, The San Bernardino County Sun (1950), no. February 25, p. 2.
- [11] Associated Press, *Rain to End Smog Attack*, The Spokesman-Review (1958), no. November 27, p. 17, Spokane, Washington.
- [12] Asa Atwater, *Toxic Fumes Believed Cause of 19 Deaths; Hundreds Stricken*, The Pittsburgh Press (1948), no. November 1, pp. 1 & 2.
- [13] Bill Barger, *Smog Control Districts Urged at L.A. Meeting*, Riverside Daily Press (1953), no. October 26, p. 5.
- [14] Bay Area Air Quality Management District, Consulted on January 23, 2024, see: [URL](#).
- [15] J. A. Bergstra, J. Heering, and P. Klint, *Module algebra*, **37** (1990), no. 2, pp. 335–372, [DOI](#).
- [16] J.A. Bergstra, A. Ponse, and J.J. van Wamel, *Process algebra with backtracking*, A Decade of Concurrency Reflections and Perspectives (J.W. de Bakker, W.P. de Roever, and G. Rozenberg, eds.), LNCS, vol. 803, Springer, 1994, pp. 46–91.

- [17] Graham Berry, *L.A. Smog Control Director Often Is Target For Abuse – Actually He Has Accomplished Much*, The San Bernardino County Sun (1954), no. November 7, p. 5.
- [18] James Bonner, *Arie Jan Haagen-Smit 1900–1977*, Biographical Memoirs, National Academy of Sciences, Washington DC, 1989, [URL](#).
- [19] California Air Resources Board, page on the history, consulted January 22, 2024, see: [URL](#).
- [20] California Air Resources Board, California’s air basins map, consulted February 19, 2025, see: [URL](#).
- [21] George Caulfield, *Bay Area’s Smog Menace Grows as Civic Action Lags*, The San Francisco Examiner (1950), no. December 17, pp. 35 & 42.
- [22] David Colander, *The future of economics: the appropriately educated in pursuit of the knowable*, Cambridge Journal of Economics **29** (2005), no. 6, pp. 927–941.
- [23] C.P. Corliss, *Butadiene Plant to Eliminate Fumes With New Process*, The Pasadena Post (1943), no. November 1, p. 5.
- [24] Daily Independent Journal, *Commuters Of Twin City Area To Form Car Pool*, 1954, no. October 1, p. 22.
- [25] Daily News, *Smog bother? Fill out form*, 1944, no. November 10, p. 41.
- [26] Daily News, *Smoke problem 70 per cent licked, says health bureau*, 1945, no. August 17, p. 41.
- [27] Daily News, *McCabe defends smog control program*, 1949, no. February 2, p. 3.
- [28] S.H. Dewey, *Don’t Breathe the Air: Air Pollution and U.S. Environmental Politics, 1945-1970*, Environmental History Series, no. 16, Texas A&M University Press, 2000.
- [29] DOGE, home page of The Department of Government Efficiency, consulted February 25, 2025 [URL](#).
- [30] John Dreyfuss, *VW and Chrysler Pass State Smog Tests, Are OKd for Sale*, The Los Angeles Times (1972), no. June 23, p. 3.
- [31] Harry G. Frankfurt, *On bullshit*, Princeton University Press, 2005.
- [32] Friends of Francis H. Packard, *Elect FRANCIS H. PACKARD*, Valley Times (1956), no. June 4, p. 28.
- [33] James T. Gilson, *Mayor Backs West Coast Plan in Fight on Air Pollution*, The Philadelphia Inquirer (1958), no. December 1, p. 2.

- [34] A.J. Haagen-Smit, *Chemistry and Physiology of Los Angeles Smog*, Industrial and engineering chemistry **44** (1952), no. 6, pp. 1342–1346, DOI.
- [35] A.J. Haagen-Smit, E.F. Darley, M. Zaitlin, H. Hull, and W. Noble, *Investigation on Injury to Plants from Air Pollution in the Los Angeles Area*, Plant physiology (Bethesda) **27** (1952), no. 1, pp. 18–34, DOI.
- [36] Hanson, Sam, *Off the Beat. SC County Gives Up Own Smog Program As Regional Effort Starts*, Los Gatos Times-Saratoga Observer (1955), no. July 18, pp. 1 & 8.
- [37] William Hendricks, *All Set If Strike Comes*, The San Francisco Examiner (1954), no. September 26, p. 16.
- [38] Chip Jacobs and William J. Kelly, *Smogtown: The Lung-Burning History of Pollution in Los Angeles*, Overlook Press, Woodstock & New York, 2008.
- [39] Thomas Jefferson, *WHAT VALLEY PEOPLE THINK*, Valley Times (1954), no. September 24, p. 14.
- [40] Daniel Kahneman, *Thinking, Fast and Slow*, Farrar, Straus & Giroux Inc, 2012.
- [41] James Krier and Edmund Ursin, *Pollution and Policy. A Case Essay on California and Federal Experience with Motor Vehicle Air Pollution 1940 - 1975*, University of California Press, 1977.
- [42] Basil E. Leever, *RUNNING AROUND IN CIVIC CIRCLES*, Press-Telegram (1945), no. February 25, p. 2.
- [43] Long Beach Press-Telegram, *County Fumes Erasure Law Studied for City*, 1945, no. January 27, p. 7.
- [44] Los Angeles Evening Citizen News, *Trial Balloons for Smog*, 1946, September 16, p. 3.
- [45] Los Angeles Evening Citizen News, *City to Merge Smog-Fighting Staff With County's Setup*, 1948, no. January 31, p. 2.
- [46] Joseph P. McCarthy, *Supervisors Will Oppose APCD Regional Planning*, The San Bernardino County Sun (1968), no. July 16, p. 15.
- [47] Metropolitan Pasadena Star-News, *ANTI-SMOG PROGRAM SUBMITTED. 16 Foothill Cities Study 8-point Recommendations*, 1945, no. November 21, p. 9.
- [48] Metropolitan Pasadena Star-News, *Fumes Law To Be Ready Next Month*, 1945, no. May 25, p. 8.

- [49] Metropolitan Pasadena Star-News, *LOS ANGELES CHAMBER DENIES APATHY. OFFERS, TO AID IN FUMES FIGHT*, 1945, no. October 10, p. 19.
- [50] Metropolitan Pasadena Star-News, *State ‘Anti-Smog’ Law Urged at Meeting*, 1945, no. September 26, p. 17.
- [51] Metropolitan Pasadena Star-News, *Supervisors Adopt Two New Anti-Smog Laws*, 1945, no. April 22, p. 11.
- [52] Metropolitan Pasadena Star-News, *Assemblyman Joins Fight Against Smoke, Fumes*, 1946, no. October 6, p. 21.
- [53] Metropolitan Pasadena Star-News, *County Attacks ‘Smog’ as Former Adviser Says Problem ‘Politics’*, 1946, no. April 22, p. 11.
- [54] Metropolitan Pasadena Star-News, *COUNTY CONDUCTS TEST OF AIR POLLUTION HERE*, 1946, no. May 28, p. 11.
- [55] Metropolitan Pasadena Star-News, *Diesel Truck Driver Cited For Smog*, 1946, no. October 30, p. 11.
- [56] Metropolitan Pasadena Star-News, *BOARD SEEKS TO ABATE SMUDGE EVIL*, 1947, no. January 9, p. 13.
- [57] Metropolitan Pasadena Star-News, *State Chamber Directors Back Anti-Smog Legislation*, 1947, no. April 28, p. 11.
- [58] Oakland Tribune, *Home Owners Protest Smog*, 1953, no. October 30, p. 29.
- [59] Thad Omohundro, *JESSUP FAILS TO OUST FUMES AIDE*, Metropolitan Pasadena Star-News (1945), no. January 23, pp. 13 & 15.
- [60] Optimist International, consulted February 19 2025, see: [URL](#).
- [61] Pasadena Independent, *What people think*, 1943, no. October 21, p. 30 & 32.
- [62] Pasadena Independent, *Citizens Demand Smog End Or Political House-cleaning*, 1946, no. October 2, pp. 1 & 18.
- [63] Pasadena Independent, *Let’s Go, Little Guys!*, 1954, no. October 20, pp. 1 & 31.
- [64] Pasadena Independent, *Auto Industry Perfects Gadget to Eliminate Hydrocarbon 80%*, 1955, no. July 28, pp. 1 & 42.
- [65] Pasadena Independent, *Best Weapon in War Against Smog*, 1955, no. June 2, p. 3.

- [66] Pasadena Independent, *Industry Aid Sought on Smog*, 1955, no. October 16, p. 8.
- [67] Pasadena Independent, *Oil Man Lays Smog to Autos*, 1955, no. October 16, p. 8.
- [68] Pasadena Independent, *Griswold Gloomy on Smog Controls*, 1958, no. December 4, p. 2.
- [69] Alexis Pedrick and Elisabeth Berry Drago, *Fighting Smog in Los Angeles*, podcast, episode 232 of Distillations, Science and History Institute, Philadelphia, 26 June 2018, episode 232 of Distillations, Science and History Institute, Philadelphia.
- [70] Petaluma Argus-Courier, *BAY AREA SMOG DISTRICT FORMED*, 1955, no. July 9, p. 1.
- [71] Press-Telegram, *Canneries Questioned on Odors*, 1945, no. October 11, p. 15.
- [72] Press-Telegram, *Anti-Smog Plans Told*, 1946, no. May 24, p. 4.
- [73] Press-Telegram, *Antifumes Plan Will Be Aired Monday*, 1946, no. October 11, p. 11.
- [74] Press-Telegram, *Antismog Plan Favored by Health Head*, 1946, no. October 17, p. 13.
- [75] Press-Telegram, *City Will Aid Smog War*, 1946, no. May 8, p. 9.
- [76] Press-Telegram, *Ending of Harbor Odor Discussed*, 1946, no. November 11, p. 12.
- [77] Press-Telegram, *Incinerator Bond Issue Vote Ordered*, 1946, no. January 22, p. 9.
- [78] Press-Telegram, *Ordinance to End Smog Voted Here*, 1946, no. November 26, p. 9.
- [79] Press-Telegram, *Pasadena Wants 'State' Smog Law*, 1946, no. July 20, p. 7.
- [80] Press-Telegram, *Smog Control Rules Detailed*, 1946, no. November 21, p. 24.
- [81] Press-Telegram, *Tests First Step in Smog Control*, 1946, no. May 10, p. 13.
- [82] Redlands Daily Facts, *Pike Opposes Air Pollution District Merger*, 1958, no. 25 January, p. 5.
- [83] Redlands Daily Facts, *Regional smog control effort planned. Nine county representatives to meet Sept. 28*, 1970, no. September 3, p. 3.

- [84] Redwood City Tribune, *Battle Smog at Home First, Urges Board*, 1953, no. November 18, p. 1.
- [85] R.E.G.H., *The way to clear the skies*, Daily News (1949), no. February 2, p. 32.
- [86] Herman de Regt and Hans Dooremalen, *Het snapgevoel: Hoe de illusie van begrip ons denken gijzelt*, Boom, Amsterdam, 2015, In Dutch.
- [87] Thomas C. Schelling, *Micromotives and Macrobehavior*, W.W. Norton & Company Inc., 1978.
- [88] Senate and House of Representatives, *PUBLIC LAW 159-JULY 14, 1955*, consulted February 22, 2025, [URL](#).
- [89] Don Shannon, *Members of U.S. Smog Committee Announced*, The Los Angeles Times (1954), no. December 7, p. 1.
- [90] William E. Simpson, *Difficulties of the District Attorney*, The Los Angeles Times (1946), no. December 9, p. 16.
- [91] South Gate Daily Press-Tribune, *Air Pollution Control Law to Be Passed Here*, 1946, no. December 7, p. 1.
- [92] South Gate Daily Press-Tribune, *Municipal Group Urges Cities to Cooperate in Smog Control*, 1946, no. November 23, p. 1.
- [93] South Gate Press, *Need Auto Exhaust Control; Car Makers Must Help—Griswold*, 1955, no. July 17, p. 12.
- [94] South Pasadena Review, *South Pasadena To Join 26 Other County Cities In Passing Uniform Ordinance Against Smog Problem*, 1946, no. May 10, p. 1.
- [95] South Pasadena Review, *Citizens Anti-Smog Committee Endorses Seven Point Program*, 1954, no. November 11, p. 11.
- [96] South Pasadena Review, *BUREAU OF AIR SANITATION IS TO BE FORMED*, 1955, no. 21 July, p. 6.
- [97] Arthur C. Stern, *History of Air Pollution Legislation in the United States*, Journal of the Air Pollution Control Association **32** (1982), no. 1, pp. 44–61, PMID: 7033323.
- [98] Stockton Evening and Sunday Record, *MV Director Raps Costly Smog Devices*, 1960, no. 21 July, p. 14.
- [99] The Californian, *Bay Area Smog Laws Are Urged*, 1955, no. March 5, p. 1.
- [100] The Colton Courier, *County Air Pollution District Formed By Board Of Supervisors*, 1956, no. 20 June, p. 1.

- [101] The Covina Argus, *State C of C Gives Unqualified Okay to Smog Measure*, 1947, no. May 9, p. 10.
- [102] The Desert Sun, *Board Adapts County Air Pollution Control Rules*, 1959, no. January 8, p. 6.
- [103] The Desert Sun, *Chamberlain Joins Jones, McCall in Smog Vote*, 1959, no. February 19, p. 16.
- [104] The Fresno Bee, *Pollution Board Views Smog Device For Cars; Cost Varies*, 1960, no. December 20, p. 19.
- [105] The Highland Park News-Herald, *City council balks at action to abate fumes*, 1944, no. September 15, p. 4.
- [106] The Highland Park News-Herald, *Supervisors authorize district attorney to act in obnoxious fumes case*, 1944, no. September 15, p. 4.
- [107] The Long Beach Sun, *Committee Fight Fume Peril Is Named*, 1943, no. October 21, p. 5.
- [108] The Los Angeles Times, *City Hunting for Source of 'Gas Attack'*, 1943, no. July 27, p. 1.
- [109] The Los Angeles Times, *HEAVY GAS FUMES IN AIR BLAMED FOR SMARTING EYES*, 1943, no. July 10, p. 1.
- [110] The Los Angeles Times, *Legal Action Hinted Over Plant Fumes*, 1943, no. September 23, p. 1.
- [111] The Los Angeles Times, *RELIEF FROM GAS FUMES PROMISED IN DECEMBER*, 1943, no. September 15, p. 23.
- [112] The Los Angeles Times, *Air Pollution Control Bureau Urged for City*, 1944, no. October, 27, p. 13.
- [113] The Los Angeles Times, *EXPERT SAYS SMOG CAN BE ELIMINATED*, 1944, no. November 28, p. 13.
- [114] The Los Angeles Times, *Law Ordered Drafted to Curb Fumes Nuisance*, 1944, no. September 16, p. 3.
- [115] The Los Angeles Times, *Legion Honors 'Times' Writer*, 1944, no. January 29, p. 11.
- [116] The Los Angeles Times, *CITIES PREPARE TO PUSH ANTI-SMOG ENFORCEMENT*, 1945, no. September 26, p. 12.
- [117] The Los Angeles Times, *Expert Arrives to Study Smog Here for 'Times'*, 1946, no. December 9, pp. 1 & 2.

- [118] The Los Angeles Times, *High School Editors Hear 'Times' Speakers*, 1946, no. March 13, p. 13.
- [119] The Los Angeles Times, *How Ainsworth Wrote Epic Novel of California*, 1946, no. September 22, p. 25.
- [120] The Los Angeles Times, *Jeffers to Head Smog Committee*, 1946, no. December 20, Part II, pp. 1 & 7.
- [121] The Los Angeles Times, *Smog Problem Topic on Radio Tonight*, 1946, no. December 10, p. 1.
- [122] The Los Angeles Times, *The Shame of the Smog*, 1946, no. 26 September, p. 16.
- [123] The Los Angeles Times, *We Can Curb the Smog Nuisance*, 1946, no. July 20, p. 12.
- [124] The Los Angeles Times, *Weather Likely to Give Smog Expert Real Show*, 1946, no. December 12, pp. 1-2.
- [125] The Los Angeles Times, *Writer to Address Inglewood Clubs*, 1946, no. May 26, p. 3.
- [126] The Los Angeles Times, *CHAMBER EXPERTS OPEN WAR ON SMOG*, 1947, no. March 20, p. 13.
- [127] The Los Angeles Times, *Governor Signs Anti-Smog Bill*, 1947, no. June 11, p. 1.
- [128] The Los Angeles Times, *Group Executive Outlines Needs in Smog Control*, 1947, no. March 13, City News, pp. 11 & 16.
- [129] The Los Angeles Times, *One Year in the Smog Fight*, 1947, no. December 31, p. 16.
- [130] The Los Angeles Times, *Smog Bill Voted; Goes to Governor*, 1947, no. June 3, p. 1.
- [131] The Los Angeles Times, *Smog Control Wins Victory in Committee*, 1947, no. April 30, pp. 1 & 5.
- [132] The Los Angeles Times, *SMOKE COMMITTEE ASKS FOR LAW WITH TEETH*, 1947, no. January 25, p. 4.
- [133] The Los Angeles Times, *System for Smog Control Unified*, 1947, October 15, pp. pp. 1-2.
- [134] The Los Angeles Times, *The Smog Bill Progresses*, 1947, no. May 4, p. 18.
- [135] The Los Angeles Times, *Let's Face Facts on Smog*, 1948, no. September 16, p. 30.

- [136] The Los Angeles Times, *No Sidetracking on Smog!*, 1948, no. November 23, p. 28.
- [137] The Los Angeles Times, *'Not So,' Oil Industry Replies to Smog Detectives' Findings*, 1948, no. September 28, p. 23.
- [138] The Los Angeles Times, *Whittier Yells 'Secede' in Trash-Burning Fight*, 1948, no. August 22, p. 3.
- [139] The Los Angeles Times, *Committee Hears Views Presented by Jeffers*, 1949, no. February 4, p. 23.
- [140] The Los Angeles Times, *Report Reveals 40 'Villains' in Smog*, 1949, no. October 25, p. 31.
- [141] The Los Angeles Times, *SMOG'S COMPLEX MAKE-UP STRESSED*, 1949, no. December 9, pp. 31 & 38.
- [142] The Los Angeles Times, *Heavy Gasoline Losses Eyed in War on Smog*, 1953, no. April 22, p. 22.
- [143] The Los Angeles Times, *4500 Hear Demand for Smog Probe*, 1954, pp. 2-4, October 21.
- [144] The Los Angeles Times, *Air Pollution Can Be Whipped, Larson Says*, 1954, no. April 13, p. 14.
- [145] The Los Angeles Times, *Auto Exhaust, Ozone Get Major Smog Blame*, 1954, no. July 29, p. 1.
- [146] The Los Angeles Times, *AUTO EXPERTS COMING HERE FOR SMOG STUDY*, 1954, no. January 8, p. 27.
- [147] The Los Angeles Times, *IRRITATED*, 1954, no. October 15, p. 3.
- [148] The Los Angeles Times, *Long Smog Fight Seen by Stanford Expert*, 1954, no. December 7, p. 13.
- [149] The Los Angeles Times, *Progress Told on Reducing Exhaust Smog*, 1954, no. January 8, p. 27.
- [150] The Los Angeles Times, *WOMEN PROTEST SMOG*, 1954, no. October 21, p. 2.
- [151] The Pasadena Post, *AN END TO TALK; ACTION NEEDED*, 1943, no. September 14, p. 5.
- [152] The Pasadena Post, *FUMES SUIT HEARING SET FOR NOV. 1*, 1943, no. October 22, pp. 5 & 10.
- [153] The Pasadena Post, *HOLDING OUR HOPE FOR MONDAY*, 1943, no. September 17, p. 5.

- [154] The Pasadena Post, *SPEED ACTION GAS EVIL*, 1943, no. September 11, p. 5.
- [155] The Pasadena Post, *Three Complaints an Hour to Health Department*, 1943, no. September 11, p. 5.
- [156] The Pomona Progress Bulletin, *Fumes and Smoke Committee is Dismissed*, 1945, no. January 30, p. 9.
- [157] The Pomona Progress Bulletin, *Irate Over County Smog Suit Whittier Talks of Secession*, 1948, no. August 23, p. 14.
- [158] The Pomona Progress Bulletin, *AS WE SEE IT .. By One of Us*, 1954, no. July 20, p. 4.
- [159] The Press Democrat, *Anti-Smog Devices On Cars Provided by Bill*, 1960, no. March 29, p. 25.
- [160] The Register, *Smudging Controls Provided*, 1950, no. June 29, p. 23.
- [161] The Sacramento Bee, *State Launches Investigation Of Air Pollution*, 1955, no. 6 August, p. 4.
- [162] The San Bernardino County Sun, *AIR POLLUTION DISTRICT SOUGHT BY 5 COUNTIES*, 1957, no. 12 October, p. 13.
- [163] The Signal, *Free fresh air*, 1945, no. February 8, p. 4.
- [164] The Southwest Wave, *RIP TIDE*, 1960, no. 4 August, p. 1.
- [165] The Whittier News, *CITY NOT TO DISCONTINUE USE OF DUMP*, 1948, no. May 18, p. 1.
- [166] The Whittier News, *City Offers To Help On Incinerator*, 1948, no. October 22, p. 1.
- [167] The Whittier News, *Functions of County Air Pollution Control District Related for News*, 1948, no. June 17, p. 9.
- [168] The Whittier News, *Chief Issues Fire Permit*, 1949, no. June 10, p. 9.
- [169] Valley Times, *Howard Stites Denies Smog In Burbank*, 1946, no. October 16, p. 3.
- [170] Valley Times, *Opposing Sides Admit Smog Suit May Relapse*, 1946, no. 19 October, p. 7.
- [171] Valley Times, *Report On Bus Fumes Enters Service Hearing*, 1954, no. January 26, p. 2.
- [172] Valley Times, *Carpenter Petitions Court for Ballot Spot In Supervisor Race*, 1956, no. August 26, pp. 1–2.

- [173] Valley Times, *BATTLE BEING WON. \$100 Million Goes Into Smog Fight*, 1958, p. 38, September 9, North Hollywood, California.
- [174] Valley Times, *MAIN PROBLEM. Autos Still Held Top Air Pollutant*, 1958, no. September 9, p. 38.
- [175] B. van Vlijmen, *Aggregation dynamics: From problems and solutions to a generalized ecology*, Transmathematica (2023), DOI.
- [176] S.F.M. van Vlijmen, *Exploration of selected problem and solution types in Los Angeles County smog control 1943-1976*, Transmathematica (2025). DOI
- [177] Peter Weisser, *18 Stern Bills Propose Curbs On Air, Water Pollution*, The Sacramento Bee (1970), no. January 6, p. 7.

A Discussion of sources

The sources are the newspaper archive www.newspapers.com, various books, documents on archive.org, www.sciencehistory.org, and websites of organisations, or their successors, that played a role in the case history, such as the California Air Resources Board. (Note that the website archive.org is blocked in the UK and may be blocked in other jurisdictions.) The newspaper archive is very rich and equipped with a good search engine. Besides big titles like *The Los Angeles Times*, it also includes many small and local newspapers. Three of the books deserve separate attention.

Smogtown: The Lung-Burning History of Pollution in Los Angeles by Chip Jacobs and William J. Kelly covers the period from the mid-1940s to the early years of the current millennium. The story begins with the issues at play in Los Angeles and follows the protagonists closely. Step by step, it zooms out to the fight with the car makers in Detroit, the State of California and the federal government. It also shows how the issues broadened from air pollution to air quality and to climate change [38].

Don't Breathe the Air: Air Pollution and U.S. Environmental Politics, 1945-1970 by S.H. Dewey covers a shorter period and describes the fight against air pollution in three regions: Los Angeles City, New York City and central Florida [28]. The book is a chronicle like the work discussed earlier. It notes the similarities between developments in the three regions mentioned above. However, the focus is on the development of environmental thinking.

The case essay *Pollution and Policy* by James Krier and Edmund Ursin has the same scope as my argument in terms of government organisations, regions and period [41]. It differs from the previous works in that the authors attempt to determine the characteristics of air pollution as a problem and the characteristics of the behaviour of the parties involved. In that sense, it is similar to my study. The difference is that it remains incidental, where I see the suggested types as instances from a general system logic.