Supplementary File S1:

3.2. Results of computed tomography

Piszczele Park is one of the three city parks in Sandomierz. Norway maple (inv. No. 1) grows at the south-eastern border of the park, on a steep slope with a slope of approx. 30°, near a spring and a brook. Nearby, there is a clearing with a fireplace and brick barbecues. After performing the sonic tomograph examination and analyzing the obtained results, there were no signs of decay at the studied point of the trunk. The wood has good sound and technically efficient, occupying 100% of its cross-section. Moreover, the electric tomography examination showed that the lowest resistivity characterized the areas located in the circumferential part of the trunk core. The average wood resistivity in this region was 56 Ω m, and in the core part, 362 Ω m. It indicates that the trunk is moist, especially in its central part. Comparing both tomograms, it was found that that there is no decomposition inside in this part of the trunk and the tree is safe for the environment.

Two magnificent white poplars are located near the main pedestrian and bicycle route in Park Piszczele, starting from J. Słowacki Street. At the base of the trunk, there were noticeable fruiting bodies of *Pholiota squarrosa* (Vahl) P. Kumm. - a saprophytic and parasitic fungus. It attacks damaged or weakened specimens most often, resulting in white wood rot, which destroys trees within a few or a dozen years, depending on the degree of infection [S1]. Analysis of the tomograms revealed extensive damage at the studied point of the trunk. On the transverse section, in the whole central part of the trunk, an advanced decay of a humus character takes place, covering 63% of the trunk's cross-section. The most damaged places are marked in blue and purple. Transitional wood, with a slightly weakened structure, occupies a small area - 7% of the entire cross-sectional area. Technically efficient wood, covers only 30% of the whole cross-section of the trunk. On the north side, damage to the inside of the trunk reaches the outer layers and ends with a small open cavity. It is important to note that hollow tree and cavity is not a disease - it is typical trait of the ageing phase (more in chapter 3.2.1). This risk increases even more when the inside of the trunk is infected with fungal pathogens or is characterized by significant decay [S2]. The low velocity of the sound wave in the most damaged places (blue color - acoustic tomograph) coincides with wood's low resistivity during the electric method's measurement (blue color - electric tomograph). It indicates the occurrence of advanced decay of the necrotic interior of the trunk. As you approach the outer walls of the trunk, the resistivity increases, which suggests a slightly better wood structure and coincides with the results obtained from the sonic tomography. The highest resistivity, but only in a small area, is characteristic of the trunk fragments in the marginal part of the cross-section and at the border that determines the minimum thickness of the remaining wall (2200 and 1860 Ω m). Most of the cross-section covers an area with a low resistivity of 63 Ω m. Considering all these findings, it should be assumed that the decomposition process is highly. We don't know if it will progress. But we know the extent of it and can check in time if it is progressing (Table 2).

In the case of the neighboring poplar (inv. No. 3), the situation is analogous. The damage level covers more than half of the trunk cross-section (56%). Technically efficient wood is 31% of this cross-section. The remaining area (13%) is occupied by transitional timber with a slightly weakened structure but not yet damaged. The most severely damaged area is located in its core on the trunk cross-section, with a northwest shift towards the trunk circumference. The place of destruction is depicted in blue and purple. The area with progressive tissue decomposition will also develop towards the south, which is suggested by the zone with transitional wood (green) growing towards the trunk's circumference, which will undergo more significant destruction after some time. When interpreting the obtained data, it was found that, as in the case of poplars with inv. 2 apparent convergences with the results obtained with an electric tomograph. Low sound wave velocities in the most damaged areas (blue color - acoustic tomograph) correlate well with wood's low resistivity during the electric method's measurement (blue color - electrical tomography). It shows the ongoing process of decomposition of the internal wood structures. When approaching the outer walls of the trunk, the resistivity increases, which suggests slightly better health and coincides with the results obtained from the sonic tomography. The highest resistivity is found in the trunk areas in the northern and southwestern parts of the cross-section (9780 and 2790 Ω m). However, the vast majority of the cross-section covers the area with a low resistivity of 11 to 33 Ω m. The results confirm the ongoing process of decomposing the trunk inside. The progressive decay of tissues is caused by the activity of parasitic fungi such as *Laetiporus sulphureus* (Bull.) Murrill) and *Pholiota squarrosa* (Vahl) P. Kumm), whose fruiting bodies are located on the trunk of the assessed tree (Table 2).

Saski Park is located almost in the center of Sandomierz, on the border of the Old and New Towns. Pedunculate oak (inv. No. 4) grows in the south-eastern part of this park. Based on visual assessment, the tree's condition can be estimated as average. There are wounds on the trunk and broken branches in the crown. The oak grows 10 m away from the pedestrianized communication route. After the examination and the analysis of the results, slight damage to the inside of the tree trunk was found only on the northern side. The cross-section shows a carious area (purple and blue) which covers 12% of this cross-section. The green area surrounding internal damage to the trunk suggests the occurrence of the so-called transitional wood, which is characteristic of the slightly weakened mechanical strength of the trunk at this point. The remaining part of the trunk cross-section (84%) is occupied by fully technically efficient wood. There is still a single focus on wood decay, occupying a small area. Tree has a considerable reserve of healthy tissue at the cross-section site. After the measurement with an electric tomograph, the previous findings obtained in the sonic tomograph examination were confirmed, i.e., the good condition of the trunk at this measurement level. It may suggest good tissue hydration. On the trunk cross-section, the wood resistivity was the highest in the peripheral part and, depending on the measurement site, ranged from 725 Ω m to even 2360 Ω m. On the other hand, the lowest resistivity and, at the same time, the highest conductivity was characteristic of the core part of the trunk and the layers of wood directed towards the outside. In this case, the values ranged from 64 Ω m in the middle of the trunk to 206-210 Ω m in the area facing the outside of the trunk. This arrangement, compared with the results obtained in the acoustic tomography examination, where these areas are marked in brown, indicates a safe wood typical of pedunculate oak (Table 2).

Lime (inv. No. 5) grows at the entrance to the Vineyard and the Church of St. James in the corner of the fence. The tree trunk grows into the wall and is characterized by a large open cavity (2 × 0.25 m) stretched over the entire length of the trunk, with an outlet at its base. The trunk has been reinforced with two rigid through ties with a spacer tube for safety. Lime grows near the transport route important for this part of the city, Staromiejska Street. Near the tree, there are many underground installations essential for the proper functioning of the city. Based on the results obtained from the sonic tomograph, according to the visual assessment, considerable internal damage with extensive, progressive wood decay was found at the studied point of the trunk. Technically efficient wood occupied an area of 33% of the trunk cross-section and damaged tissues - 43%. The remaining space of this cross-section is transitional wood (24%). The places of damage and internal voids are located primarily on the northwest part of the trunk. Large fragments of wood with a slightly weakened structure in terms of mechanical strength are visible in this cross-section's eastern and south-eastern parts. The possibility of radial cracks inside the trunk is marked in the attached tomogram as yellow lines. The tree trunk is protected by mechanical reinforcements in the form of two rigid bonds connecting the trunk at two different heights. The tree is also stabilized by the fence surrounding the trunk, and its low-set crown should not be exposed to high forces caused by extreme weather phenomena. The results of electrical tomography confirm the findings of the visual assessment and the sonic tomography examination. The places marked in blue correspond to the damage detected by both the acoustic and the electrical tomography. In this area, the lowest sound velocities and, at the same time, the lowest resistivity were recorded, corresponding to the wood necrotic distribution (7-41 Ω m). In the case of places where the resistivity increased - 531 Ω m, it is possible to guess the occurrence of losses or the beginnings of the decomposition of wood tissues, which corresponded to the blue color on the tomogram generated as a result of the sound wave test. The highest resistivity was recorded in the core part of the trunk and its southern circumference (2274-2554 Ω m) (Table 2).

Small-leaved lime (inv. No. 6) grows in the north-eastern part of the plot near the communication route leading to the church of St. James. The visual condition of the tree is terrible. The trunk has cavities and hollows, while the preserved crown has a residual form. The acoustic tomography showed that the technically efficient wood occupies only 26% of the trunk's cross-sectional area at the studied point of the trunk, which is suggested by the light-brown to dark-brown color and where the speed of the sound wave is the highest. Damaged wood, marked in color from pink through dark blue to light blue, covers an area of 66% of the trunk cross-section. Here, the speed of sound travel is the lowest. The remainder of the area is occupied by transition wood, which has a slightly weakened structure but is not yet damaged. When deciding to proceed with the analyzed tree to eliminate the threats, it is recommended to lower the crown as much as possible by removing the stump of a thick limb and a fragment of a decayed trunk to the place of regrowths in the eastern part of the tree's crown, just above the chapel embedded in the trunk, which will significantly relieve the trunk the whole tree and eliminate the torsional forces acting on the tree, and then installing a band binding below the cut site, fastening the trunk, preventing its further breaking. Considering the data obtained from the electric tomograph, it was found that the places characterized by low tissue resistivity (75-112 Ω m) correspond to regions with low sound wave velocity, suggesting a progressive decay of wood. On the other hand, areas of high resistivity (4681 Ω m), located in the southwestern part of the trunk cross-section, coincide with where is technically efficient wood (Table 2).

The common ash (tree No. 7) grows near the fence wall at the entrance gate to the church of St. Paul the Apostle area. The results of acoustic tomography show that technically efficient wood occupies practically the entire trunk cross-section at the studied point of the trunk (99%). In its southern part, small foci suggest a slightly weakened wood structure and cover only 1% of the entire cross-section. Therefore, the tree has a considerable supply of healthy tissue, which makes it safe for the environment and suggests its excellent technically efficient wood. The obtained data were confirmed during the examination with an electric tomograph. On the eastern and western side of the trunk cross-section, the highest resistivity was recorded (251-262 Ω m), which coincides with the speed of movement of sound waves, where the brown color from the acoustic tomography and the red color from the electric tomograph correspond to technically efficient wood. In the middle of the trunk cross-section is a ring system of lower resistivity (28-39 Ω m) - blue color, suggesting good tissue hydration. Compared to the results obtained in the acoustic tomograph examination, this area is marked in brown, and this arrangement indicates technically efficient wood (Table 2).

Pedunculate oak (inv. No. 8) grows on the eastern side of the parish buildings of the Church of St. Paul the Apostle (near the ravine edge). The performed tomographic examination confirmed the excellent health condition of the tree, in line with its visual assessment. No damage to the inside of the trunk was found. On the cross-section of the trunk, the sound wave traveled at high speed in all directions. The entire area covered by the measurement (100%) is occupied by fully functional wood. No anomalies indicated the occurrence of disturbing symptoms destroying the inside of the trunk. During an additional examination carried out with an electric tomograph, the obtained data confirm the good technically efficient wood of the trunk of this oak. On the trunk cross-section, the resistivity was the highest in the peripheral part and, depending on the measurement site, ranged from 298 to 462 Ω m. On the other hand, the lowest resistivity was characteristic for the core part of the trunk and the layers of wood directed towards the outside. In this case, the resistivity values range from 61 Ω m in the middle of the trunk to 153-175 Ω m, which may suggest good tissue hydration. Compared to the results obtained in the acoustic tomograph examination, where these areas are marked in brown, this system indicates safe wood. It is also a typical pedunculate oak (Table 2).

Small-leaved lime (inv. No. 9) grows on the eastern side of Collegium Gostomianum, one of the oldest secondary schools in Poland, operating since 1602. In the tomogram at the studied point of the trunk, the areas of wood destruction are scattered in a nest-like form throughout the central part of the trunk, occupying an area of 35%. The most extensive lesions overlapping with the existing cavity are on the eastern side. On the other hand, the best technically efficient wood exists on the north and south sides, covering an area of 44% of the entire cross-section. Wood with a slightly weakened structure, the so-called transitional wood, accounts for 21% of this cross-section. In the attached tomogram, the marked yellow lines suggest the possibility of radial cracks. This arrangement coincides with a significant existing defect and an overgrown crack on the opposite side of the trunk. However, the possibility of splitting the trunk was eliminated by establishing a rigid bond that binds both main branches and prevents excessive movements during strong winds. Mainly due to the scattered area of wood decomposition inside the trunk, its condition should be checked regularly, which will allow assessing whether the destructive processes are not progressing too quickly, which could increase the risk of trunk breaking. The previous findings are confirmed in the electrical tomography examinations. Places subject to decomposition processes or with internal cavities or voids are characterized by higher resistivity (17740-19170 Ω m) (red to brown color), which corresponds to low sound velocities obtained when examining the inside of the trunk with a sonic tomograph (blue color). In places where decay progresses, the resistivity is lower, as is the speed of the generated sound wave. In the area marked blue (electrical tomography), characterized by low resistivity (15-94 Ω m) and brown (acoustic tomography), where the sound wave propagates at high speed, the wood is technically efficient wood (Table 2).

The oak (inv. No. 10) grows on Milbert Street at the intersection of dirt and paved roads. On the northern side of the tree is a meadow with thickets, which are the remains of the former park. The tree is one of the few survivors from the garden of the former Kruków estate, visible on Heldensfeld's map from the 18th century. Based on visual assessment, its poor health condition was found. On the south side, at the height of 1.3 m from the ground, there is a significant deep, open cavity (1.8 × 0.8 m) with noticeable fruiting bodies of sulfuric gall (*Laetiporus sulphureus* (Bull.) Murrill). Above the defect, on the western bough, there is an open wound with well healed edges, and its fracture is visible in the bifurcation between the trunk and the west bow. On the cross-section of the trunk in its entire central part, there is extensive destruction of the interior, spreading in all directions. The most damaged areas (73%) include the trunk core (blue) and the edge part on the eastern and western sides of the cross-section (purple). Small fragments of technically efficient wood (brown) cover only 20% of the trunk's cross-section in the northern, south-eastern, and southwestern parts. The remainder (7%) is the transition wood marked in green. In the attached tomogram, the yellow lines suggest the possibility of radial fractures in three main directions. It significantly increases the risk of the trunk breaking under extreme weather conditions. Special attention should be paid to the fact that there are few places with technically efficient wood, which further increases the risk of safety against breaking. After performing electrical tomography and analyzing the obtained results, the previous findings obtained in the sonic tomograph examination were confirmed, i.e., the occurrence of a cavity inside the trunk with progressive tissue decomposition, as evidenced by the higher resistivity at the level of 220–1171 Ω m (yellow and light blue colors). In places with a necrotic distribution, the electrical resistivity is meager (41-65 Ω m), which is in line with the results obtained by sonic tomography (Table 2).

In the playground at Baczyński Street, there are two white poplars. Poplar inventory No. 11 - looks healthy visually. The base of the trunk is bottle-shaped, and the visual health of the tree is satisfactory. The tree is stable and has a regular crown. However, after the examination at the studied point of the trunk and analysis of the tomograms, the developing destruction of the internal trunk structures located in its core part was found. Technically efficient wood occupies 56% of the trunk cross-section and damaged wood 24%. The remaining surface is taken up by transitional wood (20%), which is characteristic of the slightly weakened mechanical strength of the trunk. Based on the obtained results, it is possible to confirm the good condition of the tree in terms of its mechanical strength and resistivity to trunk bending.

The stock of technically efficient wood is sufficient, which makes the tree safe for the environment. In places where decay progresses, the resistivity is lower, as is the recorded speed of the generated sound wave. In the area marked in blue, characterized by a low resistivity (80-86 Ω m) in the case of electrical tomography and at the same time a low velocity of the sound wave (acoustic tomography), the wood is damaged. On the other hand, in the peripheral part of the trunk's cross-section, there is higher resistivity (from 200 to almost 700 Ω m), which suggests healthier wood. Resistivity is lower in areas facing outwards and closes to the cortex, possibly due to better tissue hydration. In the tomogram generated from the acoustic tomography, these areas are characterized by a brown color, typical for the high velocity of the sound wave, which corresponds to technically efficient wood. Poplar is one of the species with high water content in the tissues (forming the internal wet wood), which affects the resistivity of the heartwood. However, the early stages of wet wood do not threaten the stability of the trunk of the tested tree.

In the case of the second poplar (inv. No. 12), damage to the inside of the tree trunk in its core part was found, similarly to the above. The places of the greatest destruction are marked in blue and purple on the attached tomogram. A layer of transitional wood surrounds the damaged area with a slightly weakened structure. Technically efficient wood occupies 62% of the trunk cross-sectional area and damaged wood 23%. The remaining area is treated as transition wood, taking up another 15% of this cross-section. After examination with an electric tomography and subsequent analysis of the obtained results, it was found that the areas marked in blue with low resistivity coincide with those marked in brown on the tomogram from the acoustic tomography. It indicates safe wood, but with a tendency to destruction in the future. Red-brown areas (electrical tomography) and the corresponding blue-violet areas (sonography) suggest cavities, cracks, or the beginning of caries decomposition. Wood resistivity in these areas is very high (above 122516 Ω m).

The oak (inv. No. 13) grows on a circular grass flower bed in the former church square at Opatowska Street. The tree is visually in perfect condition. The crown is well-developed in all directions and has a regular shape. After the tomographic examination at the studied point of the trunk and the analysis of the results by specialized software, no damage to the inside of the tree trunk was found. On the cross-section of the trunk, the entire surface is technically efficient wood, 100% occupied by technically sound wood. There are no tissue decomposition processes; hence, there are no places that would correspond to damaged and transitional wood. After connecting the cables and passing an electric current of 80 V through the tree trunk, the obtained data confirm the very good, even perfect health condition of the pedunculate oak trunk. On the trunk cross-section, the resistivity is the highest in the peripheral part and ranges from 338 to 414 Ω m, depending on the measurement site. On the other hand, the lowest resistivity was characteristic for the core part of the trunk and the layers of wood directed towards the outside. In this case, resistivity values ranged from 90 Ω m in the middle of the trunk to 129 Ω m, which is caused by good tissue hydration. Compared to the results obtained in the acoustic tomograph examination, where these areas are marked in brown, this arrangement indicates safe and very technically efficient wood.

S1. Kane, B.; Ryan, D.; Bloniarz, D.V. Comparing Formula that Assess Strength Loss due to Decay in Trees. J. Arboric. 2001, 27, 78–87. Available online: https://www.researchgate.net/publication/242619669_Comparing_formulae_that_assess_strength_loss_due_to_decay_in_trees (accessed on 29 May 2022).

S2. Cullen, S. Trees and wind: a bibliography for tree care professionals. Journal of Arboriculture 2002, 28:1 https://joa.isa-arbor.com/request.asp?JournalID=1&ArticleID=25&Type=2